THE CHEMIST AND DRUGGIST

TO CORRESPONDENTS.—Communications for the Editor should be addressed "To the Editor of the CHEMIST AND DRUGGIST," Colonial Buildings, 42a, Cannon Street, and if intended for insertion, should be Written *on one side of the paper only*, and authenticated by the real name and address of the writers, not necessarily for publication, but as a guarantee of good faith.

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All Advertisements intended for insertion in the current Month must be sent to **THE PUBLISHER** on or before the 12th, except Employers' and Assistants' Advertisements, which can be received up to 10 a.m. on the morning previous to publication

Subscribers are requested to observe that, for the future, the receipt of THE CHEMIST AND DRUGGIST in a *Green Wrapper* indicates that with that number the term of subscription has expired, and that no further numbers will be sent until the same has been renewed. We issue the notice very respectfully, not that we distrust our Subscribers, but simply because we find it impossible to keep an immense subscription list like that we now have, extending to almost every town in the world, in order without an exact system like this.

OUR COUNTRY AND COLONIAL SUBSCRIBERS are requested to furnish the Editor with any trade gossip that they may consider interesting.

Editorial Notes.

OFFICIAL JOURNALISM.

THE Official Reports of the Proceedings of the Council of the Pharmaceutical Society, as published in the *Journal*, meagre and insufficient as they are, seem likely to afford much material for thought to those interested in the advancement of Pharmacy and the welfare of the Society. We had occasion last month to make a few comments on the revelations of the June minutes, and it is our duty now to call the attention of the members to certain proceedings of the July Council Meeting affecting alike the relations of that body to the Press and to its constituency.

The subject may be introduced by presenting the following copy of a letter addressed to the President of the Society—a letter written in perfect good faith, and without the slightest wish to disturb the prejudices of any member of the Council:—

[COPY.]

Colonial Buildings, Cannon Street,
July 3rd, 1869.

MY DEAR SIR,—As the resolutions and votes of the Council are now published in the "*Pharmaceutical Journal*," I trust that a reporter representing the "*Chemist and Druggist*" may be permitted to attend the Council meetings.

I need hardly remind you that the proceedings of the Medical Council are fully reported in the "*Lancet*" and other medical prints, and that I am, therefore, merely soliciting for my journal a function which is indicated by a good precedent.

If I am to depend on the "*Pharmaceutical Journal*" for information respecting the doings of the Council, the subscribers to the "*Chemist and Druggist*" cannot possibly receive the report of a Council meeting until five or six weeks after date. Such delay would, I believe, be injurious to the best interests of the Society, as it would necessarily occasion the suspicion that reports of the proceedings of the Council could not be safely published until they had passed through the hands of the official censors.

Of course, if my reporter be permitted to attend the meetings I will cheerfully undertake to carry out the wishes of the Council with respect to the suppression of any matter of a private nature.

Hoping to receive the decision of the Council as soon as possible,

I am, my dear Sir,
Yours faithfully,
J. C. BROUGH.

HENRY SUGDEN EVANS, ESQ.,
President of the Pharmaceutical Society.

On the 14th of July, too late unfortunately for any notice in our last issue, the following courteous reply was received:—

[COPY.]

Pharmaceutical Society of Great Britain,
Bloomsbury-square, London, W.C.
July 13th, 1869.

MY DEAR SIR,—In reply to your favour of the 3rd inst. requesting "that a reporter representing the *Chemist and Druggist* may be permitted to attend the Council meetings" I have to inform you that I duly brought the matter forward at the last meeting of the Council of the 7th inst., and after consideration it was resolved—"That this Council cannot comply with Mr. Brough's request to be allowed to send a reporter to the Council meetings of the Pharmaceutical Society."

Believe me, my dear Sir,
Yours very truly,
H. SUGDEN EVANS.

J. C. BROUGH, Esq., F.C.S., &c.

We waited patiently for the publication of the official report of the proceedings, from which we gather the following meagre information:—

The letter having been read, it was moved by Mr. BRADY, and seconded by Mr. CARTEIGHE—

"That, as the universally-expressed feeling of the anniversary meeting was in favour of the publicity of all the proceedings of the Council of the Society, it is expedient that the request of the editor of the *Chemist and Druggist* be complied with, but that it be a stipulation that any portion of the proceedings, which the Council shall, by vote or otherwise, declare to be unsuited for publication, shall not be reported in detail."

Thereupon, the following amendment was moved by Mr. INCE and seconded by Mr. SANDFORD—

"That this Council cannot comply with Mr. Brough's request to be allowed to send a reporter to the Council Meetings of the Pharmaceutical Society."

This amendment was carried by a large majority.

The minutes illustrate in a most striking manner the insufficiency of the present system of reporting, for the simple resolution and the counter-resolution leave us entirely in the dark as to the reasons which induced the Council to move in a course at variance to that stated to be most in accordance with "the universally expressed feeling of the anniversary meeting."

We have a choice of several explanations:

1. *That a majority of the Council object to publication* in toto, *are determined to keep things as nearly as may be in the old condition, and will allow nothing to be reported that they can possibly suppress.* This explanation we dismiss as unworthy, for no single member of the Council spoke against Mr. REYNOLDS's resolution at the Anniversary Meeting, and only one voted with the very minute minority.

2. *That matters are discussed and opinions asserted at the Council Meetings which the members would not like to see published.* This we do not believe, because the concluding portion of the Resolution provides for cases in which publication would be inexpedient.

3. *That the Council has an objection to the particular Journal on behalf of which the application was made.* We do not for a moment entertain this alternative. It is true we occasionally express views at variance with those held by several members of the Council individually, but we would not do the body the injustice to believe that mere difference of opinion on matters of public economy, would affect a single vote on a broad question like the one under deliberation.

4. *The possible effect of independent reporting on the Official Journal.*—This is our last resource for the desired explanation. We can readily understand that those who look upon the *Pharmaceutical Journal* as, by right, the sole expositor of Pharmacy for the United Kingdom, may object to see an imaginary monopoly interfered with; and as our day of publication happens to fall between the Council meeting and the issue of the official journal, a *fancied* objection might arise on this score. This idea of taking the wind out of

our contemporary's sails was certainly not the motive of our application. We have no wish to derive an advantage, fair or unfair, from a mere accident of priority; but until it is shown that the first of the month is fixed by an unalterable rule as the day of publication, we submit that this objection cannot be deemed sufficient. We doubt, indeed, whether members will long remain satisfied with an arrangement which compels them to wait three or four weeks for the report of the Council proceedings. They certainly will not, if they take a proper interest in the affairs of the Society. Possibly the objection arises more from a consciousness of the meagreness of the official report than from the mere desire to give priority to a particular periodical. If this be the case it carries its own condemnation. If the members of the Council are content to publish their votes without their motives, it is no business of ours; they themselves are the persons most nearly affected. But the Council is accountable to its constituency. The members of the Council surely do not suppose that any journalist would give valuable space to a fuller account of the proceedings than the members of the Society desire to have, and if they are afraid of independent reporting, it is obvious that they are conscious that their own bare summary does not meet the legitimate desire of their members. *We* should be as little likely as themselves to waste reporting on non-essential matters.

This brings us to the whole question of Official Journalism. It is a subject on which we hold no extreme views, and can therefore speak impartially, although the official character of our contemporary was the greatest obstacle we encountered in the early part of our career. An official organ may be of infinite use, nay almost essential, to a body bent upon establishing an unrecognised doctrine, and in such a sphere the *Pharmaceutical Journal*, as conducted by Mr. BELL, did excellent work. But when once a periodical by its official character lessens the inducements to private enterprise to cater for the intellectual wants of a class, its continued existence can only be justified by unimpeachable management. Our contemporary has had a chance, such as no journal in the world ever had, of representing high-class pharmacy, yet it cannot be denied that it is, in many respects, inferior to the leading American, German, and French periodicals in the same department.

In the resolution adverted to we see but another step in the wrong direction, and our correspondence proves that it has already provoked some caustic criticism. If the Council desire to be regarded as a mere publishing firm, and to take advantage of their position, they should advertise themselves in their true colours; but if this be the case they must accept a station below the governing bodies in the medical and legal worlds. In fine, they must descend from the elevated position which, in justice to the interests of Pharmacy, and of the Society they represent, they ought by right to occupy.

THE Pharmacy Act (1868) Amendment Bill received the Royal Assent on the 11th inst., the last day of the session. It has not yet been printed, but we hope to bring it before our readers next month. The Royal Assent was given on the same day to the Seeds Adulteration Bill and the Nitro-glycerine Bill.

THE interesting Memoir of FARADAY, written by Dr. BENCE JONES, is completed in our present number. The second part of the important essay on the Sewage Question is also given. We have deemed it advisable to insert these long articles, so that we may devote adequate space in our September number to our special report of the proceedings of British Pharmaceutical Conference, which will be opened at Exeter on Tuesday next. We hope that many of our subscribers, like ourselves, are making arrangements for visiting Devonshire.

THE Royal College of Science for Ireland has issued the programme for the forthcoming session, which shows us that technical education can be obtained on exceedingly advantageous terms in Dublin. The fees are very low, and the inducements to work, in the way of scholarships, are very great. The Professors of Chemistry are Dr. W. K. SULLIVAN and Mr. ROBERT GALLOWAY.

THE *Pall Mall Gazette*, in reviewing a series of essays on Woman's Work, says:—"The business of pharmaceutical chemist and druggist must, under the new Act, be held to rank next to the learned professions; it is an enormously profitable one, and repays fourfold whatever science and enterprise may be expended in it. It may be a vulgar error, but we think a woman who had passed the examination of the Pharmaceutical Society, and was fairly embarked as chemist and druggist, with an income capable of indefinite enlargement, would be in a better and more independent position than if she were a governess with a salary of £50, or even £100 per annum."

British Pharmaceutical Conference.

INAUGURAL MEETING HELD AT NEWCASTLE-ON-TYNE IN 1863.

Year.	Place of Meeting	President.	Vice-Presidents.	Local Secretary.
1864	Bath	Henry Deane, F.L.S.	Prof. Redwood Prof. Bentley Dr. Edwards, F.C.S. R. W. Giles, F.C.S.	J. C. Pooley.
1865	Birmingham	Henry Deane, F.L.S.	Prof. Bentley Dr. Edwards J. P. Tylee W. Southall	W. Southall, jun.
1866	Nottingham	Prof. Bentley, F.L.S.	Dr. Edwards D. Hanbury, F.L.S. Samuel Parr W. W. Stoddart, F.G.S.	J. H. Atherton, F.C.S.
1867	Dundee	Prof. Bentley, F.L.S.	D. Hanbury, F.L.S. W. W. Stoddart, F.G.S. D. Russell J. Ince, F.L.S.	J. Hodge.
1868	Norwich	Daniel Hanbury, F.R.S.	W. W. Stoddart, F.G.S. J. Ince, F.L.S. R. Fitch, F.G.S. J. R. Young	F. Sutton, F.C.S.
1869	Exeter	Daniel Hanbury, F.R.S.	W. W. Stoddart, F.G.S. J. Ince, F.L.S. G. Cooper H. S. Evans, F.C.S.	M. Husband.

Treasurer:—H. B. Brady, F.L.S., F.C.S.

General Secretaries:—Prof. Attfield, Ph.D., F.C.S.
Richard Reynolds F.C.S.

SIXTH ANNUAL MEETING, 1869.

THE meeting for the present year will be held during the third week in August at Exeter, in the College Hall, under the presidency of Mr. Daniel Hanbury, F.R.S. On Tuesday, the 17th, at 10 A.M., the President will deliver an Address: the reading and discussion of Papers on Pharmaceutical subjects will then commence, be continued in the afternoon till 4·30, and be carried on during Wednesday; an adjournment from 12·30 till 2·0 taking place each day. On Thursday a complimentary entertainment to their visitors will be given by the chemists of Exeter. On Friday the chemists of Torquay invite members to view some points of interest in the neighbourhood, and partake of luncheon.

Members intending to be present are requested to communicate with the local secretary, Mr. M. Husband, 95, Fore-street, Exeter, who will give all information concerning lodging and hotel accommodation, etc.

Exeter is a city of great antiquity, picturesquely situated on the river Exe, about eight miles from the sea. Among its objects of interest are the Cathedral, remarkable for its boldness and lightness of architecture, the Guildhall and its collection of paintings, and the Albert Memorial Museum. Within easy access are the rocks and glen of Chudleigh, the vale of Lustleigh, the river Dart, Torquay on the rocky shore of Torbay, Plymouth, the Tamar, and Mount Edgcumbe. The British Association for the Advancement of Science will also hold its meetings at Exeter during the third and fourth weeks of August.

Visitors wishing to accept the invitation to the Torquay Excursion will please write at once to Mr. D. Watson, 6, Lower-terrace, Torquay. Cards will be issued up to Friday, August 13th.

Gentlemen engaged upon any investigation are reminded that papers are expected to be sent in to the secretaries at least fourteen days before the annual meeting, accompanied by a short abstract for insertion in the local and other newspapers.

Members disposed to accept any of the unaccepted subjects suggested for investigation in the list sent to them in the early part of the year; work on any subject suggested by themselves; propose any subject for investigation by others; forward for analysis specimens of drugs and chemicals whose examination might tend to throw light on the question of adulterations and impurities; propose the recognition of any pharmaceutical association and reception of its delegates by the Conference; or make any suggestions or propositions;—are requested to advise the secretaries.

The objects of this Association of Pharmacologists and Chemists and Druggists are—

1. To increase the common stock of pharmaceutical knowledge, and

2. To promote community of interests among those engaged in pharmacy.

In addition to the existing means of attaining these ends, a proposal is now made to issue to members an annual report on the progress of pharmacy; a Year-Book, which shall include notices of all Pharmaceutical Papers, Formulæ, etc., published in the various scientific journals of Europe and America. For the annual subscription of 5s., each member would thus receive a tangible *quid pro quo* in addition to the yearly volume of "Proceedings." The necessary funds for accomplishing this object can probably be obtained without making any charge in addition to the present subscription, if *Five Hundred New Members be added to the ranks.*

The Executive Committee therefore call on every chemist and druggist to offer his name for election, and on every member to make an effort to obtain more members. Nominations will be received by either of the officers.]

OFFICERS FOR 1868-9.

President:—D. Hanbury, F.R.S., F.L.S., etc., Plough-court, London, E.C.

Vice-Presidents who have filled the office of President:—H. Deane, F.L.S., Clapham Common, S.; Professor Bentley, F.L.S., M.R.C.S., 17, Bloomsbury-square, London, W.C.

Vice-Presidents:—W. W. Stoddart, F.G.S., Bristol; J. Ince, F.L.S., F.C.S., etc., London; G. Cooper, Exeter; H. S. Evans, F.C.S., London.

Treasurer:—H. B. Brady, F.L.S., F.C.S., Mosley-street, Newcastle-on-Tyne.

General Secretaries:—Professor Attfield, Ph.D., F.C.S., 17, Bloomsbury-square, London, W.C.; R. Reynolds, F.C.S., Commercial-street, Leeds.

Local Secretary:—Matthew Husband, 95, Fore-street, Exeter.

Committee:—J. H. Atherton, F.C.S., Nottingham; J. C. Brough, F.C.S., Kensington; A. J. Caley, Norwich; M. Carteighe, F.C.S., London; T. B. Groves, F.C.S., Weymouth; J. Palk, Exeter; R. Parkinson, Ph.D., Bradford; G. F. Schacht, Clifton; F. Sutton, F.C.S., Norwich.

Exeter Local Committee:—W. W. Broom, W. H. Bully, G. Cooper, R. Dowling, J. Hibberd, M. Husband, J. Knapman, J. H. Lake, G. L. Napier, John Palk, F. W. Stone, N. W. Tanner, H. W. Tighe, R. Walton.

Veterinary Notes.

DISTEMPER IN DOGS.

DISTEMPER is a contagious disease, affecting, principally, young dogs, and rarely occurring twice in the same animal. A common belief is that all dogs must have it sooner or later. There are, however, such a number of cases of immunity that no such rule can be made. Authorities differ considerably as to the pathology of distemper, which, I fancy, is partly due to the term being applied vaguely to all canine febrile complaints, and partly to its being made to include not only the acute attack, but any and every affection arising as a sequel.

"Stonehenge," in his work on the greyhound, describes it as "typhus fever," and compares the symptoms of the two diseases to prove his opinion. It is quite true there is a great similarity in the symptoms, but so there is in all febrile diseases.

The essential phenomenon of typhus in man is the eruption on the skin; without this, no other symptom or train of symptoms would justify the appellation. Distemper is not accompanied by any specific rash; we may, therefore, discard the idea of its being a canine typhus. It is really a catarrhal fever, *i.e.*, a simple fever, having local complications of the respiratory organs. These complications may merely affect the nose and throat, or, in bad cases, even the lungs. The disease, like any other fever, gives rise to functional derangement of other organs, as the stomach, intestines, kidneys, etc.; in some cases even the brain becomes affected. If it resembles any human disease, the analogy is closest in influenza.

The symptoms of an ordinary case of distemper are dulness, sneezing, dryness of nose, loss of appetite, and disordered stomach, with a watery discharge from the eyes and nose. As the disease advances, the discharge from the nose and eyes becomes purulent, the sneeze becomes a cough, sometimes of a peculiar "chokey" kind, as if the animal had some foreign body in its throat, due, probably, to attempts to dislodge collections of mucous. The whole course of the affection is marked by debility, which rapidly increases, and constitutes, perhaps, the least tractable feature of the complaint.

This is a pure case; frequently some complications occur, as inflammation of lungs, violent diarrhœa, disordered liver, causing jaundice and various nervous affections, paralysis, or convulsions. These complications are not, however, an essential part of the disease, and when met with must be treated as though distinct.

The successful treatment of distemper depends more upon good nursing than medicine. The dog should be kept in a well-ventilated dry room, an even temperature being more desirable than a warm one; fresh air, clean water, and nourishing, easily-digested food must be plentifully allowed. Exercise had better be refrained from till strength returns, and water-dogs on no account should be allowed their favourite pastime.

The nose and eyes should be frequently sponged, and in case of entire refusal of food, soups, broth, etc., should be forced. The combination of a little port wine—about a table spoonful—with the food, two or three times a day, will be found beneficial.

As regards medicine, an emetic may be given at the outset, as Antim. Pot. Tart., in doses of from two to four grains, in butter, or on a small piece of meat. The bowels must be kept regular by mild aperients, as a mixture of equal parts of castor oil and syrup of buckthorn—dose ʒij. to ʒviij.

When the more acute symptoms have subsided, the debility will require stimulants and tonics. Port or sherry wine should be given daily with the food, and some of the following forms administered:—

Quinine	℈j.
Ginger	ʒj.
Ferri Sulph.	ʒj.

Extract of Gentian, 2 s., to form twelve pills. Two or three every day.

Or—Quinine	℈j.
Carb. Ammon.	ʒij.

Extract of Gentian, 2 s., to form twelve pills. Two or three every day.

Or for debility with *diarrhœa*—

Ferri Carb.	ʒj.
Catechu Pulv.	ʒij.
Opii Pulv.	grs. x.
Creta Prep.	ʒij.

Make into twelve pills with conserve of roses. Two or three every day.

CHOREA.

Occasionally we meet with a case of general chorea, *i.e.*, twitchings of the muscles all over the body; but most commonly the affection is partial, implicating merely a group of muscles, as of the face, neck, or a limb. The movements in chorea cannot be mistaken for anything else; they are involuntary, and best seen when the animal is quiet. Chorea may be the consequence of irritation from worms or diseased teeth; it may, it is said, follow an injury to the head; but most frequently is a sequel of debilitating disease, especially distemper. Treatment is by no means satisfactory; some cases get well; but whether we should say they were cured, or that they recovered, is doubtful. Numerous drugs have been tried, and with, perhaps, equal success. Ether, ammonia, valerian, assafœtida, quinine, and strychnine, salts of iron, copper, zinc, silver, and arsenic, have all been tried, and now find strong advocates.

As forms sometimes attended with success, I recommend a trial of—

Liq. Arsenicalis	ʒj.
Tinct. Ferri Mur.	ʒij.
Infusion of Gentian	ʒxiij.

A teaspoonful twice a day.

Or—Zinci Sulph. or Z. Valerianate . .	grs. vj.
Quinine	℈j.

Confection of roses to form twelve pills. Two every day.

Abstracts of Foreign Papers.

ON A SO-CALLED DISINFECTING SOAP.

In the *Polytechnisches Journal von Dingler*, Dr. **Pincus** draws attention to a so-called disinfecting soap, the manufacturer of which states that it contains permanganate of potassium. As an active and disinfecting ingredient, this soap was made by mixing powdered permanganate of potassium with dry hard soap of the finest quality, cut into shreds, and subjecting this mixture to a strong pressure, in order to condense it into a homogeneous cake. Having submitted a portion of the freshly-made soap to examination, the author of course found that it contained oxide of manganese and a mere trace of permanganate; the greater part of the latter had, of course, been rapidly decomposed, by contact with the very oxidisable matter of the soap, and its character as a disinfecting agent thereby lost.

ACID-PROOF CEMENT

In the *Journal of the Franklin Institute* we find a good method for protecting cork from the destructive action of vapours, such as arise from boiling nitric acid, from the pen of Mr. R. F. **Fairthorne**. The cork having been bored to suit the size of the tube, is soaked for two or three hours in a solution of silicate of soda, consisting of one part of commercial concentrated solution to three parts of water. The tube was next inserted, and, when dry, the cork was covered with a paste made by mixing the concentrated solution of the silicate with powdered glass, in such proportions as to form a mass of about the same consistence as putty. This is spread on the under surface, and then washed with a solution of chloride of calcium. It soon powders, so that it is advisable to make the connection with the flask whilst the paste is in a plastic state, and to allow it to become more solid before applying heat to the vessel containing the acid. Corks prepared in this manner were but slightly acted upon, after remaining over the boiling nitric acid more than four hours, and over hot acid for ten.

ALKANIN.

Alkanin, the extract of alkanet root, threatens to replace litmus, in its use as a chemical test. Professor **Bœttger** states that M. **Hirzel**, of Leipzig, prepares this extract on the large scale. It may be dissolved in absolute alcohol and the tincture used for colouring strips of Swedish filtering paper, which, when dry, serve as a most delicate test for ammonia. Blue paper may be produced by soaking the red in a very weak aqueous solution of carbonate of sodium, and are equally delicate in their reaction with acids.

ADULTERATION OF SAFFRON.

In an article in the *Repertoire de Pharmacie*, attention is drawn to the adulteration of saffron—firstly with oil, which improves its colour; secondly, with pulverised mineral matters, such as fine sand or sulphate of lime. An estimation of the fixed matter is pointed out as the method for detecting the latter important adulteration. Good saffron should not give more than 10 per cent. of mineral matters, whereas some adulterated samples have been found to yield as much as 25 per cent., equivalent to an addition of 15 per cent. The oil may be detected with more or less certainty by extraction with ether, and comparing the result with that obtained from good samples.

ON THE COLORATION OF OILS AND FATS BY COPPER.

M. **Roussilhe**, in a letter published in the *Journal de Chimie Medicale*, points out that the colour of some oils is obtained by the action of acids on the copper vessels in which they are prepared, that some oils dissolve more copper than others, that the solution is effected easily at a high temperature, and in some cases even in the cold by prolonged contact. M. Roussilhe is of opinion that there is no proof that the medicinal effects of oils are not in some cases due to the copper they contain.

Pharmaceutical Society of Great Britain.

MEETING OF THE COUNCIL, JULY 7th, 1869.*

Present:—Messrs. Bourdas, Brady, Carteighe, Deane, Dymond, Evans, Haselden, Hills, Ince, Morson, Sandford, Stoddart, and Williams.

Minutes of previous meeting were read and confirmed.

The report of the Finance and House Committee was presented, showing on the General Fund account a balance in hand of £1,394 10s. 11d., and submitting for payment accounts, rent, salaries, and various items amounting to £834 16s. 2d.

Report received and adopted—payments ordered.

On the Benevolent Fund account a balance of £316 14s. 10d.

On the recommendation of the Benevolent Fund Committee, the sum of £5 was granted to a widow residing in London; and of £10 to the widow of a late member in Cumberland.

Mrs. Sarah Wilson, of Kendal, was approved as a candidate for an annuity.

The report of the Library, Museum, and Laboratory Committee was received and adopted.

A letter from the Privy Council was read, approving the appointment of the Examiners.

The Board of Examiners in London reported that during the previous month they had examined 108 Candidates, and passed 88.

The Board recommended that in future persons appointed to examine candidates in the First or Preliminary Examination in the Provinces, must have graduated at one of the Universities of the United Kingdom.

It was moved by Mr. Ince, seconded by Mr. Brady,—That a Member of the College of Preceptors, or a Pharmaceutical Chemist by Examination, might also be appointed to conduct such Examinations.

Moved by Mr. Williams, and seconded by Mr. Morson, as an Amendment,—That the appointments be confined to Graduates of the Universities and Members of the College of Preceptors.

Division taken.

For the Amendment,—Deane, Evans, Haselden, Morson, Sandford, and Williams.

Against—Bourdas, Brady, Carteighe, Hills, Ince, and Stoddart.

The Chairman declared the original motion to have been carried.

Moved by Mr. Sandford, and seconded by Mr. Williams,—That on receiving application from a Candidate who desires to undergo the Preliminary Examination in the Provinces, the Secretary shall, if necessary, apply to the Local Secretary of the district in which the Candidate resides for information as to some person qualified to conduct such Examination.

The Board submitted two forms, one for the appointment of gentlemen to examine Candidates for the Preliminary Examination in the Provinces (those residing more than 10 miles from London), the other for the result of such examinations, which, with certain verbal alterations, were agreed to. Ordered that these regulations should be published in the ensuing number of the *Pharmaceutical Journal*.

The Board of Examiners, Scotland, reported that during the month of June they had examined and passed eleven Candidates.

The following Professors were re-appointed for the ensuing year:—

Professor Redwood, Chemistry and Pharmacy. The Lectures to be fully illustrated by experiments and practical demonstrations.

Professor Bentley, Botany and Materia Medica.

Professor Attfield, Practical Chemistry and Director of the Laboratory.

William Augustus Tilden, B.Sc., was also re-appointed Demonstrator of Practical Chemistry.

A communication from Dr. Attfield was read setting forth the necessity, owing to the increased number of students in the Laboratory, for the engagement of additional tutorial assistance; the question was referred to the Library, Museum, and Laboratory Committee, with authority, if they thought fit, to appoint the Senior Bell Scholar of the present session to be an Assistant in the Laboratory for the ensuing session.

A letter from the editor of the *Chemist and Druggist*, Mr. Brough, was read, requesting that a Reporter might be permitted to attend the Council meetings, for the purpose of publishing the Proceedings of the Council in the *Chemist and Druggist*.

Whereupon it was moved by Mr. Brady, seconded by Mr. Carteighe,—"That, as the universally-expressed feeling of the anniversary meeting was in favour of the publicity of all the proceedings of the Council of the Society, it is expedient that the request of the editor of the *Chemist and Druggist* be complied with, but that it be a stipulation than any portion of the proceedings, which the Council shall, by vote or otherwise, declare to be unsuited for publication shall not be reported in detail."

The following, as an Amendment, was moved by Mr. Ince, and seconded by Mr. Sandford,—"That this Council cannot comply with Mr. Brough's request to be allowed to send a Reporter to the Council meetings of the Pharmaceutical Society."

The Amendment having been put, the following voted:—

For,—Messrs. Bourdas, Evans, Haselden, Hills, Ince, Morson, Sandford, Stoddart, and Williams.

Against,—Messrs. Brady and Carteighe.

The Amendment was then put as a substantive motion, and carried.

Letters were read from Mr. Barnard S. Proctor and others on the operation of the Pharmacy Act with respect to "Vermin Killers," etc. Referred to the Parliamentary Committee.

Mr. Hills gave notice that at the next meeting of Council he would propose that a deputation be appointed to attend the Pharmaceutical Congress of all Nations to be held at Vienna in September next.

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* From the *Pharmaceutical Journal*.

AN APPARATUS FOR PREPARING NITROUS OXIDE GAS.

BY MR. I. F. PORTER.*

NITROUS oxide first came into general use in this country as an anæsthetic, about sixteen months ago. Since that time it has been my almost daily duty to prepare large quantities of this gas for the dental and other hospitals. In its manufacture many accidents have unavoidably happened, and with a view of preventing the occurrence of these, the apparatus employed has been subjected to many modifications and additions, and the method of working has also been varied. By the use of the apparatus about to be described, not only have breakages arising from over-heating and from undue pressure become very rare, but greater reliance may be placed on the purity of the gas obtained. Therefore, I feel great pleasure in introducing the result of my experience to the notice of chemists and dentists.

In preparing nitrous oxide from pure nitrate of ammonia, three important points require special observation, viz. :—

1. The temperature employed must be unvarying, and such that the only products of decomposition are nitrous oxide and water.

2. Impurities resulting from the use of impure salt, or from the employment of too high a temperature in the preparation of the gas, are to be removed by passing the gas through appropriate solutions.

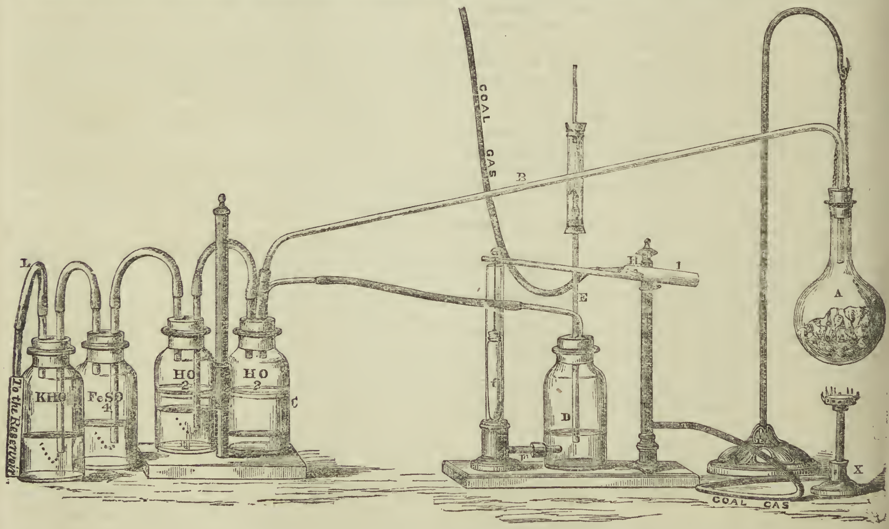
3. The whole of the air must be expelled from the flask and wash bottles before collecting the gas.

The necessary articles are—Pure nitrate of ammonia; a good Bohemian glass flask, of suitable size and shape; four wash bottles; glass and india-rubber tubing; water; solution of caustic potash and solution of protosulphate of iron; a lamp (gas or otherwise), fitted with some appliance by means of which the heat may be regulated according to the rate at which the gas is liberated.

Nitrate of ammonia, from the great demand, is made by neutralising pure nitric acid with pure carbonate of ammonia. In this way a pure and comparatively cheap article is obtained. If, however, the carbonate of ammonia contain any chlorides, or if the nitric acid contain any traces of sulphuric acid or hydrochloric acid, the salt will contain chlorides and sulphates, and when heated will give off chlorine and nitric oxide.

The arrangement of apparatus, which experience has shown to be best, is represented by the accompanying figure.

A, is a wide-mouthed glass flask of about 60 oz. capacity; this is fitted up with a large cork, carrying a glass tube, B, three-quarters of an inch wide, and is suspended in any convenient manner over the naked flame of a Bunsen's burner, by means of a chain or wire passing round the neck, just below the lip. The tube B connects the flask with the bottle C, passing through the cork of the latter, which carries in addition, two other tubes—one communicating with D (to be afterwards described,) and the other communicating with a wash bottle. The bottle C and the wash bottles have each a capacity of 40 oz., and the first wash bottle contains 16 oz. of distilled water. The exit tube of the first wash bottle opens beneath the surface of a solution of protosulphate of iron (1 part of salt to 7 parts of water), contained in a second wash-bottle, and the exit tube of this is again connected with a third wash-bottle, containing 15 oz. of a solution of caustic potash (equal parts of liquor potassæ and water). Lastly, the third wash bottle communicates with a reservoir. C acts as a receiver for the condensed water from the nitrate, and also permits the passage of air to the flask A when this cools down at the end of the process. The bottle D which, with its immediate connections, may be conveniently called the "thermal moderator," has fitted into its neck a cork carrying three tubes. By means of one of these, it communicates with C. The other tube E, has attached to its outer end a whistle, at such a height that it shall never be within sixteen inches



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* Communicated by the Author.

of the surface of the water in D. The opposite end of the tube E passes midway into the water in D; D is also provided with a side aperture near the bottom. Into this aperture is fitted by means of a cork, a tube F, bent at a right angle, as shown in the figure. F is widened above the ordinary level of the water, to permit free upward and downward motion of a small float *f* within it; *f* is attached by means of a cord to the end G of a lever G H; which has for its fulcrum the axis of a stopcock H, which regulates the supply of gas to the Bunsen's burner X. At the opposite end of the lever is a counterpoise I, of such weight that when *f* is supported by water rising in F, the arm G of the lever is raised, and the position of H is altered so as to diminish the supply of gas.

The principle of this apparatus is based upon the fact that the height of a column of liquid supported by pressure, transmitted through air, is directly proportional to the greatness of the pressure, and the fact is utilised by causing variations in the height of such a column—corresponding to variations in the pressure which supports it—to affect by means of a float, the long arm of a stopcock which regulates the supply of fuel to the source of heat.

The working of the apparatus may be described as follows:—

When the evolution of the gas in A is more rapid than its escape through C into the wash bottles, part of the pressure produced is necessarily exerted upon the surface of the liquid in D. The water in D is forced into F, *f* rises as does simultaneously the arm G of G H. It is evident that this action partially closes the stopcock H, and thus diminishes the supply of gas to the burner; the temperature in A is lowered, the action becomes less energetic, pressure decreases, and the arm G falls, and the heat is again raised. After a number of these fluctuations, each one less evident than its predecessor, the rate of the evolution of the gas and the heat required to maintain it become so nicely balanced, that G remains stationary throughout the remainder of the operation, often extending over a period of from four to six hours. At a point short of the total extinction of the gas flame the arm is arrested by a stop, so that when the pressure diminishes, re-lighting is rendered unnecessary; this is a great advantage. If the gas be evolved too rapidly in consequence of too great proximity of the flame, or if the escape of gas be cut off by any means (as for instance, because of the doubling of an india rubber tube, or because the bag has become full), indeed, if the pressure be unduly increased in any manner whatever, water slowly rises in F until the cork H is closed as nearly as the stop will permit, and ultimately, so much water is forced out of D, that the gas escapes by rushing up the tube E, sounding the whistle in its passage, and giving an alarm. The operation being ended, and the heat turned off, as A cools and the air within it contracting on cooling, more air finds admission passing through the whistle and the bottles D and C, thus placing beyond possibility any of those accidents so common when the delivery tube from the generating flask terminates under water.

The "thermal moderator" is then a self-regulating apparatus, adjusting the heat necessary for an important operation, according as circumstances require it; and if the operation becomes dangerous, this it indicates by sounding an alarm.

The "thermal moderator," though only an addition to the ordinary apparatus used in the preparation of nitrous oxide, is indeed the most important part of this apparatus. By properly regulating the temperature, the formation of higher compounds of nitrogen, such as nitric oxide, nitrous anhydride, and nitric peroxide, as well as the libration of nitrogen itself, is entirely prevented, as also is the bubbling over of the fused nitrate, which sometimes solidifies in the delivery tube of the flask, causing the latter to burst, to the personal danger of the operator. Another advantage attaching to the "thermal moderator," is that no necessity exists for disconnecting the delivery tube B. With an apparatus of this kind and four pounds of nitrate of ammonia, 100 gallons of gas have been produced in four hours without more attention than that required to start the operation and turn out the gas at the end.

A CHEMIST'S VIEW OF THE SEWAGE QUESTION.

READ BEFORE THE CHEMICAL SECTION OF THE GLASGOW PHILOSOPHICAL SOCIETY, *April* 19*th*, 1869.

(*Continued from page* 509.)

ABOUT twelve months ago, I read a paper on this subject before the Sewage Association of Glasgow; since then, the members of that association, with all their varieties of opinion, have passed one unanimous resolution—that, whatever system be adopted, the excreta must be kept out of the public sewers, the expression of a conviction which will be that of any patient inquirer into this difficult question.

In the paper referred to, I endeavoured to show that, whatever may be the best, the present water-closet system, with all its boasted advantages, is the worst that can be generally adopted; briefly, because it is a most extravagant method of converting a mole-hill into a mountain. It merely removes the bulk of our excreta from our cities, to choke our rivers with foul deposit, and rot at our neighbours' doors. It increases the death-rate, as well as all other rates, and introduces into our homes a most deadly enemy, in the shape of the sewer gases.

Since then, the report of Messrs. Bateman and Bazalgette has appeared, and it proposes (what everyone knowing the views of the authors would at once have predicted), to put down miles of costly sewers to carry the excreta to the Ayrshire coast, where, perhaps, the inhabitants may oblige us to take it back again; in other words, to commit the error of London, and wake up in a few years to the same bitter repentance.

We cannot be surprised at this; we cannot expect homœopathic treatment from an allopathic physician, especially if, as in this case, "bleeding" is to be again the universal cure. The engineer's treatment of town excreta always reminds me of the country doctor in America, who put all his feverish patients through a course of convulsions, because, though he didn't understand *fevers*, he *could* cure *fits*. In our numerous discussions, I have always maintained that chemists have been most unfairly treated in this matter. The public like to see what they pay for; they can see bricks and mortar, and therefore have allowed engineers to give them an intimate pocket-purse knowledge of this expensive commodity, for which they have paid in more than one sense—through the nose. Engineers have too fondly believed that water is the great purifier, and so they dilute the excreta with 365 times its bulk of water, and reduce its value to 1d. per ton, and then turn round on the chemist and expect him to reverse the process, pick out the penny, and repay the expenditure. Now, if it were a simple mixture—if it were only to separate the grain of wheat from the sack of chaff—the problem would be difficult enough; but we know the case to be far worse than this—it is the handful of yeast in the sack of flour that we are called upon to extract, and the fermentation of which we are expected to prevent, *after* it has occurred. A small portion of dilute sewage, mixed with a large excess of water, soon renders it all equally offensive, and the problem of extracting its value is one which no chemist need ever attempt to solve.

The water-closet, with many apparent advantages, and with all our prejudices in its favour, carries an attendant train of evils, which I am fully persuaded will ultimately doom it to oblivion.

As, therefore, engineers have not put the subject fairly before chemists, I propose to take a noble revenge, and put the subject fairly before engineers. I ask them why they consider water to be the only vehicle for removing excreta? —why not earth?—why not air? Have they ever fairly investigated or thoroughly experimented on the other methods? Have they not rather confined their studies to *fits*, and forgotten *fevers?*

So many attempts have been made by chemists to pick up the halfpence that engineers have so plentifully flung into the mud, that I cannot even notice them, except to remark that, in the opinion of all the scientific chemists who have specially investigated these attempts, they have all signally failed.

I must allude, however, to the process of Mr. Chapman, as one of the latest methods of dealing with town sewage; this is a process of distillation, after treatment with lime and thorough putrefraction. He, however, confesses his difficulty, by wishing to reduce the sewage of this city from 31,000,000 gallons to 1,000,000 gallons daily. This, of course, requires a complete alteration in the existing system, and it still dilutes the excreta with more than ten times its bulk of water. The lime process, and the putrefraction required to decompose the urea, would be extremely offensive, and require vast storing tanks. In working 1,000,000 gallons daily (it would more probably amount to 2,000,000 gallons), he would have to treat 4,464 tons daily, the total chemical (not the extractible) value of which is 2s. 6d. per ton; and he expects to do this with 20 tons of coal. He proposes to adopt an ingenious arrangement of eight boilers, steaming exhaustively, to distil off the ammonia, heating up the feed sewage, after precipitation by lime, by the hot water discharged from the boilers by a kind of brew-house refrigerator with its object reversed. He expects to distil off 1-12th; but I think it must be at least 1-10th, or 100,000 gallons, evaporated by 20 tons of coal = 5,000 gallons to 1 ton. The report of Professors Lyon Playfair and Johnstone puts the average evaporation for Scotch coal at 7·7 tons, or 1,712 gallons per ton, and at this rate 58 tons would be required for the mere evaporation. Then, for raising the heat, the same report says that 1 ton of Scotch coal raises 56 tons of water from 32° to 212° F., or, say, 50 tons of water from 52° to 212° F., requiring, therefore, 96 tons for heating up, making a total of 148 tons a day, Mr. Chapman, therefore, expects to save, by heating feed water, and by exhaustive steaming, a total of 128 tons of coal daily, or 600 per cent. Can this be done? If it can, then whatever may be the result of his process, as applied to sewage, it will make him the greatest and most daring authority on that equally important subject, the economy of fuel. He puts down no loss for radiation. This should, I think, be at least 10 per cent., which would require nearly as much as his total calculated expenditure for fuel. In using eight boilers, of 4,000 gallons each, he expects to get off all the ammonia in half an hour's steaming. Now, we all know that the estimation of free ammonia in the laboratory is one of the most tedious processes, requiring a long-continued ebullition, and the experience of distillers, on the large scale, amply corroborates this, and proves that it does not pay to distil liquors containing under 1 per cent of ammonia (some manufacturers double this estimate). The total amount in the sewage to be distilled would be under 0·2 per cent.; I think, therefore, that the process of Mr. Glassford, of evaporation with sulphuric acid (for which I must refer you to his pamphlet on London sewage), is better than this; fuel is the great question in both, but in his the results are certain, in Mr. Chapman's they are problematical.

Both are, however, connected with the water system, which I believe to be a mistake, and I think we must ultimately come, either to a system like Capt. Liernur's, by what may be called pneumatic despatch, or to the dry-closet system. Of the former I have fully treated in a former paper, and wish now to speak more particularly of the latter. During the past year, Moule's dry-closet has been largely introduced; all who have used it speak in the highest terms of its efficiency, and there are already strong indications of its becoming the system of the future. It is the only system that has succeeded during the hot fortnight at the Wimbledon meeting; and it is particularly adapted to hot climates, where the evils of the water-closet are most conspicuous. The objections urged against the system, when earth is used, are—1st, the large quantity of earth required—three and a half times the weight of the excreta; and, 2nd, the difficulty of obtaining the quantity required, and of drying it. Now, both these difficulties are disposed of by using charcoal. I employ, by preference, sea-weed charcoal, because it is the most porous, the best absorbent, and the cheapest. It only requires one-fourth of the weight, compared to earth; and when the mixture is removed and placed under cover, it soon dries. This mixture can be stored for any length of time, and used again several times. When convenient, it is re-burned, like the char in sugar refineries, except that this process is carried out in apparatus which admits of collecting the ammonia and other products condensed. The whole of the ammonia is thus collected; whilst the phosphoric acid, potash, and mineral matters, accumulate in the charcoal, together with the carbon from the organic constituents of the excreta. The weight of the charcoal is increased to the extent of about 5 per cent. with each using, and, if dried and re-used five times about 25 per cent. with each re-burning. With this constant addition, the char does not require replacing with fresh material, so that its cost is only a primary outlay—the ultimate result being that the excreta is deodorised by a charcoal derived from itself, and a company working this process would, in addition to securing the whole of the ammonia, become sellers of a charcoal second only in value to that from bones to the extent of, in Glasgow, if the process were general, 19 tons a day, or 6,935 tons a year; the total quantity of excreta which Glasgow has to remove being 385 tons a day, and its value, at 29s. 6d. per ton, = £569.* The ultimate result being the same, any charcoal may be used at first. The process is carried out without odour, from the closets to the finished products. Of course the process may be modified; for instance, suppose the char to be used five times, and only dried, the addition to its value would be as follows (I take equal parts, as this charcoal will absorb at least an equal weight of even urine):—

1 ton seaweed char, at £3 = 30 cwts. manure at £9 7s. 6d.
5 tons excreta, at 29s. 6d. = £6 5s. per ton.

Or, if re-burnt, it would yield 25 cwts. of charcoal, and the whole of the nitrogen would pass over in the distillation, as ammonia. Dr. Wallace estimates the cost of re-burning char in sugar refineries at 3s. 6d. per ton for labour and fuel, containing 31 per cent. moisture, which would be much over that referred to. Here, then, we have a simple process for recovering the whole of the value from excreta, of general application, and the results of which can be predicted by chemists with absolute certainty, as far as those products to which we at present attach value are concerned; but the uncertain portion is, as usual, the most interesting, for in the destructive distillation of excreta we are exploring a new field, which promises great interest.

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* Value given in my former paper.

I regret that I am obliged to bring this paper forward before the new products have been studied. The distillation generally is remarkably similar in its products to that of bones, and also to that, which most resembles it, of sea-weed. Besides ammonia, acetic acid, with a little butyric acid, acetone, and pyrrol are the most marked bodies. I cannot speak more definitely of these products in this paper, as they are still under investigation. The following analysis of urine is taken from Miller, representing the average composition in 1,000 grs., sp. gr. 1·020. The calculated percentage of nitrogen is appended:—

				Nitrogen.	In 100 parts of solid matter.	Nitrogen.
		Water	956·80			
Sol Matte", 43·20.	Organic, 29·97.	Urea	14·23	6·64	33·00	15·40
		Uric acid	0·37	0·12	0·86	0 27
				6·76 =NH³, 8·2. =Sulphate of ammonia, 31·86, or 3·18 per cent.		15·67 =NH₃, 19. =Sulphate of ammonia, 73·72.
		Alcoholic extract.. ..	12·53		29·03	
		Watery extract	2·50		5·80	
		Vesical mucus	0·16		0·37	
	Inorganic, 13·35.	Chloride of sodium ..	7·22		16·73	
		Phosphoric acid	2·12		4·91	
		Sulphuric acid	1·70		3·94	
		Lime	0·21		0·49	
		Magnesia	0·12		0·28	
		Potash	1·93		4·47	
		Soda..	0·05		0·12	
			999·94		100·00	

The average portion voided by each individual may be taken at 40 ozs., and of fæces, 4 ozs., total 44 ozs. daily; or, 1·7 ozs., solid, from urine, and 1 oz., solid, from fæces = total of 2·7 ozs. solid excreta daily. The following analysis of the fæces is from Berzelius:—

Water		75·3	
Bile..	0·9	5·7	Solid matter, 24·7.
Albumen	0·9		
Extractive matter ..	2·7		
Salts	1·2		
Insoluble residues of digested food		7·0	
Insoluble matters added in intestinal canal — mucus, biliary resin, and peculiar animal fat		12·0	
		100·00	

Containing, according to Playfair—
15 p.c. nitrogen, and 45 p.c. carbon, and about 25 p.c. ash.
=nitrogen 3·75 p.c.
=4·55 NH_3.
=17·65 p.c. sulphate of ammonia.
=70·71 in dry solid matter.

The ash contains, according to Porter:—

	Ash of Fæces.	Ash of Urine (calculated).
Chloride of sodium	1·33	54·15
Phosphoric acid	36·03	15·89
Sulphuric acid	3·13	12·73
Lime	26·46	1·57
Magnesia	10·54	0·89
Potash	6·10	14·45
Soda	5·07	0·38
Peroxide of iron	2·50	—
Carbonic acid	5·07	—

Assuming, then, the proportions voided to be in the proportion of 17 dry, from urine, to 10 dry, from fæces, the resulting chars may be expected to have the following composition:—

	Urine.	Fæces.	Mixed Excreta.
Percentage of char in dry solid matter	50	70	57
Ammonia = sulphate ...	73·72	70·71	72·60

Composition of Chars.

	Per cent.	Per cent.	Per cent.
Carbon	33·33	45·00	37·65
Chloride of sodium	36·10	0·33	9·51
Phosphoric acid ...	10·60	9·01	10·01
Sulphuric acid ...	8·49	0·78	5·63
Lime	1·05	6·61	3·11
Magnesia	0·60	2·63	1·35
Potash	9·64	1·52	6·63
Soda	0·26	1·26	0·63
Peroxide of iron ...	—	0·62	0·23
Carbonic acid ...	—	1·26	0·46

The nitrogen in the mixed excreta, in the proportions voided, is equal to 4·49 per cent. of sulphate of ammonia.

In the char from urine, the phosphoric acid is principally combined with potash, and therefore soluble. This char alone would be a valuable manure as containing a large proportion of soluble phosphates; but the result of commencing with sea-weed charcoal, which is rich in carbonate of lime, will be to form phosphate of lime at the expense of the carbonate—in other words, to form, by treatment with urine, re-burning, and washing, the animal charcoal required by the sugar refiner. This expected result is verified in the following tables of analyses. I regard the phosphate of lime thus gradually formed, from its minute state of division, to be quite equal, in agricultural value, to ordinary soluble phosphate. The washed residual char from fæces is at once available for the refiner, as it contains about 26 per cent. of phosphates of lime and magnesia, with but a small proportion of carbonate. I know no reason why the product of disintegrated bone and muscle should not be used for this purpose as well as the bones themselves.

In distilling 100 tons of the dry product from mixed excreta, therefore, we should obtain 72 tons of sulphate of ammonia, and 57 tons of a charcoal containing 10 per cent. of phosphoric acid in its most available form for manure, and 6 per cent. of potash. It will be seen, from Berzelius's analysis, that nearly 50 per cent. of the fæces consist of fatty matter—how will this appear in the distillation? In a population of 500,000, this item amounts to nearly 7 tons a day!

I expected a loss of ammonia in drying, but it is very small, and appears to arise from the free lime in the char, as it will be seen further on that the loss decreases in using the char with urine. In a small experiment with urine, I found the total loss, in drying by artificial heat with new char, to be 2·06 per cent. of the ammonia, or 0·105 per cent. of the urine employed.

I append analysis of 1 lb. of char which was re-burnt fifteen times with an equal weight of urine; a portion of the char was lost, which prevents my giving the increase in weight; I believe, however, the addition of carbon would be too slight to effect an increase in the total, with so many re-burnings. The percentage is decreased:—

	Char used.	After re-burning.	Increase per cent.
Water	10·0	2·80	—
Soluble salts... ...	0 6	11·15	10·55
Insoluble	89·4	86·05	—
Soluble.			
*Chloride of sodium ...	—	8·75	8·75
Sulphuric acid ...	0·3	0·34	0·04
Phosphoric acid ...	—	2·00	2·00
Potash	0·3	2·40	2·10
Insoluble.			
Carbon	54·4	29·40	—
Silica, etc.	9·1	13·10	4·00
Phosphate of lime ...	4·8	20·05	15·25
Carbonate of lime ...	17·4	19·75	2·35
Carbonate of magnesia	3·4	3·40	—

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* In this and the following analyses, the whole of the chlorine has been calculated, for convenience, as chloride of sodium, which, in some cases, is therefore too high.

The urine used appears to have been deficient in sulphates and high in phosphates, these two ingredients being subject to considerable relative variation. The distillates gave 192 ozs. liquid, containing free ammonia equal to 3,047 grs. sulphate, or 2·9 per cent. of the urine, showing a slight loss, inseparable from destructive distillations on the small scale. The charcoal should be used at least five times before re-burning, and for urine alone it may be employed ten times. I append a table, showing the analytical results of this process with urine:—

	Increase, per cent. 1.	2.	3.	4.	Increase, per 1,000 grs. of Urine. 1.	2.	3.	4.
Dry solid matter	33·30	62·50	210·00	347·94	33·30	31·25	42·00	34·79
Char	7·50	12·90	80·40	151·96	7·50	6·45	16·40	15·19
Ammonia sulphate	21·70	36·80	51·12	105·64	29·00	29·90	31·60	47·31

RESIDUAL CHARS.

	Composition, per cent.					Increase, per cent.				Increase, per 1,000 grs. of Urine.			
	Ordinary Char.	1.	2.	3.	4.	1.	2.	3.	4.	1.	2.	3.	4.
Water	10·00	1·60	3·00	—	—	—	—	—	—	—	—	—	—
Soluble salts	0·60	15·80	19·80	39·40	52·20	15·20	19·20	38·80	51·60	20·40	15·70	24·30	22·78
Insoluble	89·40	82·60	77·20	60·60	47·80	—	—	—	*41·60	2·04	23·90	19·60	12·47
Soluble.													
Chloride of sodium	—	5·40	13·10	28·02	24·70	5·40	13·10	28·02	24·70	7·18	10·60	17·30	11·06
Sulphuric acid	0·30	2·05	3·29	3·77	3·77	1·75	2·99	3·47	3·47	2·33	2·64	2·21	1·62
Phosphoric acid	—	2·20	0·40	trace	1·60	2·20	0·40	—	1·60	2·92	0·32	—	0·71
Potash	0·30	2·80	4·99	7·00	10·38	2·50	4·69	6·70	10·08	3·32	3·89	4·10	4·62
Insoluble.													
Carbon	54·40	37·40	40·00	35·40	28·20	—	—	—	*26·20	*4·50	5·30	11·06	7·19
Silica, etc.	9·10	13·60	10·00	8·00	4·40	4·50	0·90	—	*4·60	8·98	3·57	3·14	1·06
Phosphate of lime	4·80	8·00	9·60	11·40	10·20	3·20	4·80	6·60	5·40	5·84	5·40	6·10	4·08
Carbonate of lime	17·40	20·40	13·20	4·20	1·14	—	—	—	*16·25	9·73	2·60	*0·88	*1·22
Carbonate of magnesia	3·10	5·40	3·10	1·93	1·20	2·30	0·06	—	*1·90	4·08	0·98	0·57	0·23

WASHED CHARS.

	Composition, per cent.					Increase, per cent.			
	Ordinary Char.	1.	2.	3.	4.	1.	2.	3.	4.
Carbon	54·40	45·30	51·80	58·40	59·00	*9·10	*2·60	4·00	4·60
Phosphate of lime	4·80	9·60	12·40	18·80	21·34	4·80	7·60	14·80	16·54
Carbonate of lime	17·40	24·60	17·10	6·90	2·40	7·20	*0·30	*10·50	*15·00
Carbonate of magnesia	3·10	6·50	4·10	3·10	2·51	3·40	1·00	—	*0·59

* Decrease.

No. 1 is from charcoal dried up with ten times its weight of urine before re-burning; No. 2 has been treated with twenty times its weight, No. 3 with fifty times its weight, and No. 4 with 100 times its weight of urine before re-burning. It will be seen, that in No. 4 more than the theoretical amount of ammonia is obtained; that from Nos. 1, 2, and 3 are obtained by simple destructive distillation. No. 4 only yields ammonia equal to 50·48 per cent. of sulphate when heated in this way, the quantity given, 105·64 per cent., being that obtained with soda-lime; the residual nitrogen is not left in the char, but goes off in the distillation in some other form than ammonia. I shall recur to this subject in a subsequent paper. The retention of nitrogen after drying is, however, extraordinary, when the product yields ammonia equal to 105 per cent. of sulphate. No Peruvian guano can be compared to this in fertilising value.

The washed chars acquire the composition which fit them eminently for the sugar refiner.

The experiments with closet excreta are unfinished, and it is difficult, in working on small quantities, to obtain uniform results. We find one of Smith's dry-closets use ½ lb. of sea-weed char per charge, the charge of dry earth being 2 lbs. Moule's closet uses rather less. There were seven uses in our first experiment, the contents of the pail being re-burnt at once, without drying.

Weight before distillation ... ... 130 ozs.
Residual char weighed ... ... 48 ,,
Weight of excreta 82 ozs. = 11·7 ,, per use.

The distillation gave 66 ozs. of gas liquor containing free ammonia = 2·8 ozs. sulphate = 3·4 per cent. of mixed excreta; this represents only the free ammonia, or that existing as carbonate, a portion is combined with acetic acid, which was not estimated.

The same method is equally well adapted for treating pot ale from distilleries, and blood and offal from slaughter-houses. The former is an important subject in Glasgow, and I can, in this paper, only shortly allude to it. According to Dr. Wallace, one of the distilleries in Glasgow sends into the sewers 83,000 gallons of this pot ale, containing nitrogen equal to 118 grs. of ammonia per gallon; so that the daily discharge of this one distillery is equal to the total excreta of 48,970 persons, or one-tenth the population of Glasgow.

The process can be adapted with ease to urinals as well as closets. I am enabled to exhibit some mixtures of charcoal and night soil made twelve months ago. I was curious to know if these mixtures had gone further in the oxidation of the ammonia, and formed some nitrates, but not a trace can be detected.

I submit that the dry-closet system, with this process, has the following great advantages:—

1. Total freedom from all odour. All must have noticed sometimes the sickly odour of a water-closet, arising, not from the excreta, but from the gas from the sewers.

2. Certain prevention of all contamination and spread of infectious diseases arising from sewer leakage into our wells or sewer gas into our houses.

3. Saving of water, equal, in Glasgow, to £40,000 a year, if the water-closet system were general.

4. Saving of expense in repairs and removal. 1 cwt. of charcoal per month is sufficient for each closet when used by six persons daily, and the whole may be allowed to fall at once from the closet, through a 12-inch pit, to a cesspit below the house. A cess*pool* is a serious evil, but I know of no objection to a cess*pit*.

5. By this process alone can the whole of the valuable material be recovered for our lands.

Dr. Fergus has shown some remarkable examples in which gastric fever has been traced to the escape of sewer gas through small openings eaten through the top of the soil-pipe. This appears to be a wide-spread evil. I have examined some of these specimens, and find the substance to be a sort of lead plaster, containing, also, lime and some fatty acid, which requires further examination. I have shown that only remedial measures can be adopted, where the water-closet system has been carried out, by placing boxes of charcoal in the closets, and filtering the sewage through charcoal before allowing it to enter rivers.

Our authorities want, of course, some grand scheme; but they forget that the question is one of minute details. We are assailed by a large army of small nuisances—one, at least, to every house, and we must attack them one at a time. Attacked in their united strength, they will assuredly overcome us. Ought we not rather to strike at the root of the evil? Ought we not to stop the mischief at its numerous sources, and before these can combine into a mighty force, which carries everything before it?

Let the subject be calmly and carefully discussed; let us not be carried away by great schemes and useless expenditure; let us not leave to posterity heavy taxes, with barren wastes and desolate cities, but let us rather pay our own way, and leave our country fertile and our towns pure, and I shall never regret that, however imperfectly this subject has been brought before you, my earnest wish has been to strike "one more blow for life."

A lively discussion followed the reading of the paper, the general opinion of the members of the section being highly favourable to the process, which was considered the most novel and practical which has yet been introduced.

ON THE IMPORTANCE OF THE STUDY OF BOTANY TO PHARMACISTS.

BY F. P. BALKWILL.[*]

THE profession we have adopted is one of great responsibility. Confidence is reposed in us by the public and the legislature, while the sister professions of medicine and surgery rely on our aid, and are indebted to the skill and efficiency with which we second their efforts, for the success of their endeavours to alleviate the sufferings of humanity.

The Pharmacist, therefore, is no tradesman who by assiduous attention to the markets, by extravagant advertisements, or even by close application to the ledger and counter, aims merely at the ultimate accumulation of wealth. Far higher is his calling; far nobler his aspirations. In his hands instrumentally are the issues of life and death; health and happiness await his bidding, for the Physician might prescribe in vain, unless the medicines were properly made and correctly dispensed, and a mistake at any moment might prove fatal.

It is therefore necessary that he should have received the highest mental training, and should continue to devote his mind to culture and to the study of those things which will develop the habit of accurate attention, and earnest thought. At present so vast are the fields of knowledge that one man can only cover a limited area, hence it arises, that in the metropolis, medical men may devote their entire energies to mastering one department of the human frame, and the diseases incident to it, so that they can have very little opportunity for pushing investigations in Chemistry or Botany.

While, therefore, the Physician is studying the pathology of disease, and practising the healing art—while the Apothecary is acquiring greater proficiency in surgery and collating facts from clinical papers, the Pharmacist should be exploring the treasures of the material universe, and not only understand the details of what science has already placed at his disposal, and keep his knowledge on a level with the age, but bringing both practical and theoretical knowledge to bear, should be one of those who win fresh acquisitions from the stores of nature, and add their quota to the general treasures of mankind. The Materia Medica comprises all drugs officially recognised as of medicinal value. Have we then exhausted the resources of the world? are there no medicines undiscovered as potent as opium or as valuable as quinine? We do not believe in the "Elixir Vitæ," we have discarded the confection of Mithridates and the treacle of Venice—but every plant and every chemical compound, varying however slightly from another, has doubtless, its definite uses to which it might be applied if all its properties were rightly understood.

This "Materia Medica" comprises substances treated of by Chemistry and Botany, which are indeed allied, since organic Chemistry treats very largely of those compounds of Carbon, Hydrogen, Oxygen, and Nitrogen, which are derivatives from the vegetable kingdom, and which have only been formed under vital stimuli by the living organisms of plants. What a surprising part is played by this kingdom in thus bringing together and building up organic compounds and producing new series of elective affinities out of crude matter for the sustenance of the higher organisms of animal life. How wonderful is it that out of the stores of the coal beds, black and dead as they appear, dyes of every hue, odours of every flower, flavours of every fruit, can by chemical agency be evolved; and yet not one of these substances shall be produced without the intervention of the plant life, while new ones may be made which never existed until called into being by the Chemist's wand.

When we consider that not only roots, seeds, flowers, fruits, barks, and woods—but that also alkaloids, many acids, resins, gums, volatile and fatty oils, camphors, ethers, alcohols, sugars, starches and albuminoid compounds, as glutin and legumin,—are of vegetable origin, we at once see how important a position that kingdom holds in our medicinal lists, and how desirable it is that we should be acquainted with the plants that produce them—the climate that matures them, and the laws which govern their development—so that we may not only be able to determine the genuineness, but also the efficacy of a drug, the soil and season necessary for the richest production of its active principles, and the part of the plant in which those principles mainly reside.

Botany will do this, and more; it will teach us where valuable food is to be obtained for the use of man, how poisonous juices are to be eliminated by cultivation or destroyed by cooking. Thus one poisonous family of plants, viz., Solanaceæ, yields us the potato—another, Euphorbiaceæ, tapioca—a third, Araceæ, supplies Portland arrowroot and rhizomes, which, when boiled or roasted, are used as substitutes for yams under the name of coco.

Organic Chemistry will explain the principles upon which the commercial success of the Pharmacist often depends. Thus, in making pyroxylin, a very slight alteration of the formula or strength of the acids used to act upon the nearly pure cellulin—cotton wool—will make a gun cotton intended for collodion, insoluble—or one meant for blasting purposes, non-explosive, because nitric acid forms four distinct substitution compounds with cellulin (which is the basement of all vegetable tissue) in which 6, 7, 8, and 9 equivalents respectively of hydrogen are replaced by the same number of equivalents of $N\,O_2$.

In making Syrups and Alcohols from Sugar how valuable is the information that by too long boiling with water, especially with any acid present, as there is in Syrup of Lemons (Citric Acid), the sugar absorbs water chemically and becomes changed into inverted or uncrystallizable sugar, called Lævulose, and the syrup loses its sweetness and consistency: or that if sugar has been melted and barley sugar formed, a mixture of Dextrose or starch sugar and Lævulosane is produced, which when dissolved and fermented with yeast yields only half the alcohol the original Sucrose (or cane sugar) would have made—the Lævulosane remaining unfermented in the solution. While the knowledge that Sulphuric Acid changes cellulin into Dextrine, or British gum, has proved of considerable value in the manufacture of vegetable parchment from paper by its aid.

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[*] Read before the Association of Chemists and Druggists of Plymouth, Devonport, and Stonehouse.

In systematic botany we find groups or natural families of plants arranged together, from striking similarities of structure, into classes and orders, not merely by arbitrary distinctions but by a scientific view of their physiological affinities; and as their secretions, and the composition of their products and educts, depend somewhat upon that structure, we are not surprised to find so often a uniform type of organisation accompanied by a similarity of results.

This is a connection too important to be overlooked; and it will not only assist us in classifying the products themselves, but it will also indicate to us the source whence we may probably supply a missing link in any given group of remedial agents. Thus Assafœtida, Sagapenum, Ammoniacum, Galbanum, and Opoponax are the concrete juices of certain umbelliferous plants (Narthex or Ferula, etc.) matured in Persia and the east. Do we want any other fœtid gum-resins—let us try the indurated juices of other tropical umbellifers.

This order yields us caraway, anise, fennel, dill, cummin, coriander, and celery seeds—in the fruit reside linear oil vessels, called "vittæ;" these vessels contain carminative essential oils of strong flavour. If we want some new flavour or carminative we might examine other cremocarps with success, and as carrots and parsnips are such valuable vegetables, other esculent tuberous, or tap roots, might be tried under cultivation, which would increase the edible constituents and decrease the too powerful flavour, and thus supply new delicacies for the table.

This order includes some virulent narcotic poisons which reside in the watery juice, as hemlock (Conium Maculatum), fools' parsley (Æthusa Cynapium), water dropwort (Œnanthe Crocata), and water hemlock (Cicuta Virosa).

The Umbelliferæ are known by their five stamens growing with five inflexed petals round a double fleshy disk (Stylopode), which crowns the two-celled ovary, its fruit of two five-ribbed mericarps containing "vittæ," linear receptacles of oil, and its umbellate inflorescence.

Let us examine the qualities and characteristics of a few orders.

Ranunculaceæ comes first; from the fact of every part, sepals, petals, stamens, and carpels being distinct and growing in their right order, it is known by its numerous hypogynous stamens and free carpels.

This has acrid poisonous watery juice. The upright meadow and other crowfoots have burning juice, Hellebore, Stavesacre seeds, Larkspur, and Monkshood, or Aconite, from which that very strong poison Aconitina is produced and whose root has so often proved fatal when eaten by mistake for Horse Radish—are types of the order.

The Poppy order (Papavaceæ) with its milky juice, has two properties, narcotic and acrid—the former associated with a capsular fruit, like the Poppy head; the latter with a long pod called ceratium, as in the Yellow Horned Poppy, and the Greater Celandine (Glaucium luteum, and Chelidonium Major). It is known from Ranunculaceæ by its two sepals, four petals, and syncarpous fruit—*i. e.* the carpels grown together to form one ovary; and from Cruciferæ by its numerous stamens.

The order Cruciferæ, is marked by antiscorbutic and alterative properties, and a pungency which proves a condiment and not a poison—it yields us cabbage, turnip, brocoli, seakale, mustard cress, water cress, scurvy grass, radish, and horse radish; and from its seeds we derive large quantities of oil, as colza, rape, and mustard. It is known by its cruciform flowers, tetradynamous stamens and two-celled fruit with a replum, called a silique or silicle.

In making mustard poultices it should be borne in mind that the essential oil of mustard, on which its strength depends, does not exist in the seeds, but is produced by the action of an albuminoid ferment of either white or black mustard seed acting on the myronate of potash of the black mustard seed when water is mixed with the flour, much in the same way as the essential oil of bitter almonds is developed from the action of emulsin on amygdalin—when therefore, hot water is used, especially if boiling, the albumen being coagulated, the process is stopped, and the chemist gets the credit of having supplied bad mustard, since the poultice is next to useless. We must skim over Malvaceæ and Linaceæ. The former mucilaginous and demulcent, its inner bark very fibrous. Marsh-mallow root comes from this order, and cotton,—the hair of the seeds of Gossypium Herbaceum, which though cellular can be woven, from the circumstance that two hairs are compressed together into a flat twisted tissue. The latter is important from its linseed yielding oil-cake and meal, and its fibre linen and lint.

The order Leguminosæ has leguminous fruits or papilionaceous flowers, sometimes the flower is rosaceous, and sometimes the fruit is a drupe, but if the flower is regular the fruit is a legume; if the fruit is a drupe the flower is papilionaceous. It is known from Rosaceæ by the odd lobe of the five fid calyx being invariably inferior in Leguminosæ, and superior in Rosaceæ. This large order has varied productions, yet there is a marked arrangement in its sub-orders—thus in Papilionaceæ we find many nutritious species, viz., peas, beans, lentils, and pulse, which are rich in legumin, a flesh-forming food. Vetches, clover, lucerne, medick, and trefoil, are fodder plants. Papilionaceæ also includes balsams, Peru and tolu, cowhage, red sandalwood, and Indian kino; rosewood, indigo, gum, tragacanth, liquorice, &c. The Cæsalpineæ are distinguished by purgative qualities, of which Senna is the type. Tamarinds, cassia fistula, and the carob bean belongs to this sub-order. Dyes, as logwood and Brazil wood. Balsams, copaiba; resins, anime and copal; and magnificent forest trees, of which Lindley quotes one in Brazil, a locust tree 84 feet in circumference at the base. Astringency of the bark and its production of gum characterise the sub-order Mimoseæ. Various acacias yield gum Arabic and Senegal; and one supplies catechu and cutch, so extensively used in commerce.

The order Rosaceæ has only one poison—prussic acid found in peach blossoms, mountain ash berries and the kernels of stone fruit, with some astringents as in tormentil root, rose petals, and sloes. It furnishes us with our best fruit. The almond sub-order has delicious drupes,—peach, plum, cherry, nectarine, greengage, apricot, and almond. It is most closely allied to the Leguminosæ, both having a simple fruit composed of but one carpel, and both frequently producing exudations of gum from the bark.

The rose sub-order affords the succulent etærios—strawberries, raspberries, and blackberries.

The pome sub-order, contains apples, pears, quinces, and medlars.

This order is known by its numerous perigynous stamens, regular corolla, and the superior odd lobe of its calyx. It may be at once distinguished from the poisonous ranunculaceæ by its stamens adhering to the calyx.

The vast order Cinchonaceæ is represented here by the madder, it includes large tropical trees, and furnishes us with quinine, cinchonine, and their allies, as febrifuges, coffee as a beverage, and ipecacuanha as an emetic.

Solanaceæ is conspicuous for narcotic poisons. Belladonna, hyoscyamus, stramonium, and tobacco are derived from it, and digitalis from its ally Scrophulariaceæ.

Labiatæ known by its didynamous stamens and four nutted fruit, is remarkable for its fragrant essential oil, contained in receptacles throughout the entire herb. It also has bitter extractive and tannin. Thus we have mint, peppermint, pennyroyal, thyme, origanum, lavender, balm, sage, horehound, and hyssop. These grow best in a temperate climate, hence the high price of our English oils of lavender and peppermint.

Coniferæ, the cone bearing order, furnishes us with much timber:—deal, pine, cedar. Its woody fibre is peculiar, being of the kind called glandular, it yields turpentines, resins, and pitch, of which a large variety are in use, but doubtless far more are unknown.

Among Monocotyledones, or plants having one seed-lobe, Liliaceæ and Graminaceæ deserve most attention,—the former yields us aloes, squills, onions, and garlic; its flowers are showy, as the tulip; and fragrant, as the lily; its bulb is distinguished from the corm of Colchicaceæ by being a bud (of scales), not a stem (solid); it is known from Amaryllidaceæ by its superior fruit. The latter yields the sugar cane, and all our cereals—Rice for the tropical swamps of China, Africa, Egypt, and South Carolina; Maize for the warm climates in America, Africa, and Australia; Rye for the northern and central parts of the continent; Wheat for the warm temperate zone and the most civilized races of man; Oats, Barley, and Millet-seed besides, filling our pastures with herbage and our ricks with hay.

Thus, have I sketched all too briefly the outlines of defined plan; no longer should we imitate the unsystematic empirical guess-work of the charlatan, or the desultory experimenting of the herbalist, but guided by the deductions of science, and basing our investigations upon sound theory, we should explore the unknown by the aid of the known.

Few of us know the events of our future lives, we can hardly tell in what places or under what circumstances a few years may place us. To-day we are in the centre of civilisation, our knowledge is small compared with that of those around us, and we may see but little scope for these investigations. To-morrow we may be among the pioneers in a far-off land, with an unexplored flora around us, ourselves the centre of the thought and intelligence where we dwell.

At all events, every year lessens the number of those who know more, and increases that of those who know less than ourselves.

Great men have gone before us—great men are amongst us still; we know not how long ere we are called to supply their places, and it behoves us to fit ourselves to fill those positions worthily and well. Chemistry has unfolded fact after fact to her votaries, and left their names inscribed on a roll from which time will not easily obliterate them. Cookworthy and Prideaux are honoured names, and the nation will not knowingly let that of Sir Humphrey Davy die. Botany is no less interesting and valuable, and the investigation of her secrets bring the mind of man into direct communion with creative thought. It is struck with the beauty and order, the harmony and regularity which pervades her structures; of what simple materials she builds up her mighty fabrics. A little sun, a little rain, fresh air, and good ground, and the tiny seed of cellular tissue, with its simple organisation, swells upwards, till as the weight of centuries hangs on the mighty branches, ten thousand thousand pennons flutter praise to God. And, when primæval forests had done their work, they stored up, in the coal beds, almost exhaustless reservoirs of force for our parlour hearths, our kitchen stoves, our manufacturing fires and locomotive engines. While to day their successors purify the air we breathe, consume its carbon, restore its oxygen, and fit it for the continued wants of the human race.

In studying Botany the student must follow Nature to her wilds,—the rocky shore, the purling brook, the mountain, and the marsh alike invite his step, he acquires skill as a microscopist, he developes the capacity of accurate and close attention, and in his morning walk he discovers, with delight, that the ozone of the dawn compensates by its invigorating vitality for the fatigue of the walk, his appetite for breakfast is excellent, his head for business clear, and when he rests at night his sleep is sweet.

FRAILTIES OF THE FACULTY.—II.*

THE members of the Medical Profession in Canada do not appear to be immaculate, if we may judge from the following, which appears in the Montreal *Evening Star* of July 23rd, under the heading, "Doctors and Druggists":—

> "A correspondent signing himself 'Justice,' and one of the foremost druggists of Montreal, writes us thus:—
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> 'Is it fair? Is it honest? Unfortunately I am a druggist, and as such I am frequently called upon by my customers to prescribe for their little ailments. Knowing it is not lawful in the country for druggists to prescribe, I invariably refer them to the doctor, and what return do you think I get for doing so? Why, sir, in nine cases out of ten my customer is prescribed for by the doctor, *and sent to some other store to get his prescription dispensed;* and this is an every-day occurrence. Now, I should like to ask the doctor whether the druggist has any incentive to keep within the law, and not poach on the doctor's preserves?
>
> The only remedy which the druggists, who refuse to commit themselves to this abominable percentage system, can apply, is to open the eyes of the public to the fact that they have a perfect right to take their prescriptions to their own family druggist, and that for a doctor to order them not to do so is a piece of impertinence and professional humbug, which very few families in England would submit to.
>
> When a doctor knowingly influences his patient to leave the drug store, where he may have dealt with satisfaction for years, in order to send him elsewhere, and that for no other reason but because he has an underhand arrangement, whereby he gets back part of the money paid to the druggist for the medicines, in addition to his regular fee, it is such a self-evident breach of medical etiquette, as well as such a mean piece of injustice to druggists generally, that it is surprising men who are for ever pitching into quackery and humbug, and who hold positions as professors of medical colleges, should be guilty of such practices.'"

The readers of the CHEMIST AND DRUGGIST will probably remember an almost exactly parallel case in London, which we commented upon a few months ago. On this, however, we shall not now dwell further. But there are questions of a somewhat lighter character, which are generally referred to as matters of professional etiquette, which from time to time, or rather in one form or another, constantly occupy an altogether inordinate space in the columns of the medical press. The glory surrounding a profession does not seem to endow its members with the gift to see themselves as others see them; and to outsiders a squabble for dignity is one of the most undignified proceedings which can be carried on by an intelligent body of men. It may not exactly concern us, nor do we presume to arbitrate on these Laputan discussions, still less should we care to assume the position of oracle and referee in little personal disputes between the rival practitioners of country villages, which have sometimes secured an unwarrantable prominence in the pages of our contemporaries. But as lookers-on, we may hold and express our opinions on one or two of those questions which exercise the lofty minds "in another place." First of all there is the "secret medicine" dispute. We read in an advertisement issued by a well-known publishing firm that a certain formula for the preparation of chlorodyne was introduced into the work advertised "for the use of those who think it degrading to prescribe secret medicines." This sentence, whether the irony is intentional or not we can hardly say, does express exactly the state of feeling entertained by many in the profession on this subject. They do not question the excellence of chlorodyne, for example, as a remedy for many cases which they meet with, and they would gladly prescribe it, and, indeed, do so sometimes, if they think they will not be found out by their medical brethren; but all the time they feel they are doing something degrading and disgraceful. Of course there are others who are vexed with no such scruples as these, and whose study seems to be to mystify the dispenser and lumber his stock with every new French, German, and American preparation which he hears of; and such a cosmopolitan prescriber as this is certain to hear of a great many. This kind of gentleman is not by any means our model; but in an abstract point of view we almost prefer his reckless catholicity of ideas to the timidity of the man who thinks a certain "secret medicine" would be the best he could give under the circumstances, but who dares not order it because he or Mr. Grundy thinks the use of such degrading. Now, unprofessionals are perfectly willing to leave the selection of remedies to those whose experience has fitted them to choose with the best judgment; but, gentlemen, in the name of honesty and common sense, do not delay or avoid curing us if you can help it, just because you have imbibed some silly whim about the dignity of your calling. You do not deny the right of any one, doctor or not, to prepare a special medicine; nor can you give any reason why the inventor should not keep his formula a secret if he chooses. Besides, after all, what is there that is not a secret medicine to you? You know as much of Chlorodyne as you do of Apomorphia, or, to express our meaning more distinctly, we ask, whether the chemical formula of quinine gives you a key to the medicinal properties of the alkaloid.

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* Communicated by a member of the Pharmaceutical Society.

We hope it will be understood that we are not now commending any patent medicines whatever; nor should we have made a text of a mere advertisement if we had not known that the expression was tacitly endorsed in many quarters. We merely enquire why it should necessarily be degrading to prescribe or use "secret medicines."

Another breach of etiquette which causes much anxiety, at least to the *Lancet*, is what it describes as "Unprofessional Advertising." By this we do not now refer to the indecent—or, if not indecent, absurd—announcements by which even qualified quacks will occasionally endeavour to puff themselves into notoriety. Such advertising as this either defeats its own object, or is to be condemned as a social nuisance; and our object certainly is not to defend the practices of the scum of the profession. But what we now allude to is a system which has become popular among men of eminence, and to which we are obtuse enough to see no manner of objection whatever, either as regards manners or morals. A young physician, perhaps of considerable ability, and very likely having plenty of spare time, employs that ability and leisure in writing a book on some special medical subject, which may or may not prove to be a work of value. In order that the book may become known and bought, he instructs his publisher to advertise it in the *Lancet* and other medical journals. So far, good. But he must go no further. If his work be one that shall hereafter be looked upon as of standard excellence, the public will hear of it in time, but such acquaintance must come by a circuitous route, and must by no means be fostered directly by himself. The mere fact of a simple announcement in the *Times* need not of necessity be a crime, even in the opinion of the *Lancet*. Such announcements do appear in shoals, and are of course paid for by the authors directly or indirectly. Now, only the unsophisticated suppose that the primary motive of such advertisements is to sell the books. Manifestly, the limited sale which works of that character can ever command would never pay for the extensive and continual advertisements which, in the *Times* and other papers, London and provincial, are given to them. The sinister motive is therefore very apparent. It is by this means to bring and keep before *the public* the name of a certain doctor in connection with a certain branch of medical practice. This is stating very fairly the system to which the *Lancet* has on many occasions devoted columns of indignant protest, and which it has stigmatised as Unprofessional Advertising. Any one can imagine the style of argument adopted to condemn this practice, but it seems to us to be a simple question of free trade. Of course we object to every form of cheating, and for this reason we hesitate to describe this plan even as a trick of trade. Strictly speaking, there is a kind of trickery involved in it, but we really could never whittle our conscience to so fine a point as to perceive anything unjustifiable about it; nor shall we be much shocked when the time comes, as it probably will, when surgeons and physicians will openly dare to insert their cards as advertisements in the newspapers as freely as they now use the brass plate. To call the practice "Unprofessional" is, however, clearly a mistake. We should rather describe it as "Professional Advertising."

We may conclude this paper with the barest reference to Sir William Jenner's most able address. As a special plea to the Medical Conference at Leeds, his glorification of medical science was excellent, and the daily press echoed his sentiments so vigorously, that no wonder if the much-believing public accepted for the nonce the conclusion that, of the various arts and sciences, medicine was now "the greatest of them all." This impression, however, we regard as erroneous. Medical practice is, after all, not much more than a system of groping in the dark, though we readily admit that this requires far more skill than walking in the light. Sir W. Jenner appealed to results, and so do we. At present, the statistics of health and the rate of mortality tell a different story to the rose-coloured fireworks of the Leeds Conference.

COAL MINE EXPLOSIONS.

THE following suggestive letter has been addressed to a contemporary:—

SIR,—The frequent occurrence of these deplorable coal mine explosions, and the fearful sacrifice of human life which they entail, call loudly for improvements in the present imperfect system of working these mines; and I doubt not, if scientific men would turn their attention to the subject, that means would be found to render the working of a coal pit as safe from explosions as the ordinary working of a stone quarry.

It is true we have the safety-lamp, but its feeble light too frequently induces the miner to open it and use the naked light. What he wants is a more powerful light, and one that he can have no access to, and also a system of ventilation that would bring to the required spot an abundant supply of cool air.

I have frequently observed that many of the most urgent requirements of modern arts and manufactures are supplied by simple adaptations of means already known and employed for totally different purposes, so different, in fact, as to present to ordinary minds not the slightest analogy. I will give you an example of this, as it bears strongly on the question of coal mining, and affords, I believe, a means of preventing the possibility of explosion where gunpowder is not used.

In explanation of this remark, I may mention that I am at the present time busily engaged in investigating the action of combustion under excessive pressure in furnaces where the flame is bottled up (so to speak) like steam in a steam-boiler, by which means the heat is intensified in the ratio of the pressure employed, so that the most refractory substances known to man may be fused or dissipated in vapour with the same quickness and facility with which our most easily fusible substances are melted. In one modification of these furnaces the workmen operate in a large iron room, where the pressure of the atmosphere is greater than it would be at a depth of ten miles below the surface of the earth, and where the temperature, under ordinary circumstances, would be such that no attendant of a Turkish bath could endure it for a single hour. Yet these men and the furnace they tend may, by a simple arrangement of apparatus, be supplied with thousands of cubic feet of air per minute, as cool, or if necessary much cooler, than the surrounding atmosphere.

It may be said that these facts, interesting enough in themselves, have no interest for the coal miner; they apparently offer no security to him; he has no need of a source of heat so intense as to liquefy the most refractory metals as rapidly as wax melts in a common fire. All this is quite true; but the miner, enclosed all day between black masses of coal above and around him, requires a powerful light to see what he is doing—a light that never fails, that never goes out, that never requires trimming, and, above all, a light that effectually prevents the mixture of air and gas which pervades all coal mines from entering the flame and becoming ignited. Now, these are precisely the conditions obtained by combustion under pressure, which offers to the miner a source of the most brilliant light wholly inaccessible to the inflammable air of the mine. As a simple illustration of the fact, let us suppose a small iron box, a little larger than a policeman's lantern, having a thick plate glass, or a bull's-eye, on one side of it; in the lower part is a common gas-burner, supplied by a pipe from a gasometer above ground; the supply of air to support combustion is arranged in a similar manner, and supplied under pressure from above ground; a small aperture is made in the top of the lantern for the escape of the products of combustion. Now, if the air and gas are supplied to this light under a pressure of, say, 1 lb. per square inch, the light would be brilliant, and the escape from the orifice at this pressure (or even far less) would prevent the possibility of any external gases entering and becoming ignited. In this way every gallery in a mine may be lighted like a workshop, to the great comfort and cheerfulness of those whose whole lives are spent in the cheerless gloom of these dangerous workings.

The mode of advancing the light as the work progresses, and its direction by the use of reflectors, and other necessary details of the system, are simple enough, and need not be here entered into.

I only hope, for humanity's sake, that my suggestion may be put in operation by some of our large coal proprietors, as its success would afford me the greatest gratification, for I am convinced that the thorough lighting of a coal pit and its ventilation so as to insure health and safety to the miners are purely a question of £ s. d. There is no lack of scientific knowledge or the practical skill necessary for such a purpose, and probably a cost of 3d. per ton on coal would accomplish all that could be desired; and I feel assured that this would be cheerfully paid by every one to secure the miner from these terrible disasters, and ourselves from the moral responsibility and discredit of the present system.

I am, Sir, your obedient servant,
Denmark-hill, Aug. 10. H. Bessemer.

THE BRITISH ASSOCIATION.

Great preparations are being made at Exeter for the reception of the British Association next week. A new hall has just been completed capable of holding 2,000 persons. The new wing of the Albert Museum is also finished. Various excursions are organized, and altogether the association week is expected to be very successful. The President-elect, Professor Stokes, is to be the guest of Lord Devon at Powderham, where there will be several other distinguished guests. Lady Rolle will likewise receive a number at Bicton. Lord Clifford will receive the Abbé Moigno, a celebrated Italian *littérateur*. Sir Stafford Northcote will entertain at Pynes Lord Fortescue, Lord Stanley, M.P., Lord Houghton, Lord and Lady Colchester, Sir C. Trevelyan, Mr. Baring, and others. Sir Henry Ferguson Davie will have staying with him, at Creedy, Colonel Sykes, M.P., Mr. D. Dalrymple, M.P., Professor Newton, Professor Lawson, &c. At Claremont Sir John Bowring will entertain Professor Huxley and several distinguished foreigners. The order of proceedings starts with a general meeting of the council and committees of sections of the association on Wednesday, the 18th inst., when the committees and officers of the various sections will be appointed. On the same evening the President, Professor Stokes, will deliver the inaugural address at the New Victoria-hall. On the following day the presidents of the seven sections will deliver their addresses, and the reading of papers will commence. A *soirée* will be held on Thursday evening in the Museum. On Friday evening Professor Phillips, D.C.L., F.R.S., will lecture on Vesuvius. Saturday will be slack in the sections, as there are to be two excursions on that day—one to the extreme west and the other to the extreme east of the county; but in the evening Professor Miller will deliver his lecture to the operative classes in the Victoria-hall. As it is intended for working men and their families, the prices for admission is fixed at 2d., and it is fully expected that there will be very numerous applications for tickets. On Monday the sectional meetings will be supplemented by a lecture on the Sun, to be delivered in the Victoria-hall by Mr. Norman Lockyer. The sections will resume work on Tuesday, and on Wednesday, the 26th, the British Association week in Exeter will terminate with the Mayor's luncheon at the Royal Public Rooms.

COMPULSORY VACCINATION.*

The system of compulsory vaccination, which has been working with such excellent results in Scotland and Ireland since 1864, is now, in consequence of the Act passed in 1867, making its way in England with the general assent of public opinion, although not without some indications of discontent. It is a common infirmity of human nature to object to be compelled to do anything, even if the act itself be one to which we would otherwise be favourably disposed; and of course we object still more strongly if it be one that we view with suspicion or dislike. No wise Legislature, therefore, would have recourse to compulsion for the attainment of an end that could in any other way be arrived at; and when the compulsion appears to invade parental rights, it may readily be conceded that a case of more than usual strength is required in order to justify it. Such a case, we believe, clearly existed with regard to compulsory vaccination; for although the extent to which the practice had been voluntarily adopted had reduced the deaths from smallpox in England to something like a tenth of what they had been before vaccination was known, the annual victims of that hideous disease still amounted to many thousands. In 1868, from the accumulated neglect of vaccination under the previous lax law, which, when nominally compulsory, provided no machinery for enforcing its provisions, the deaths from smallpox in a single town in England—Sheffield—were nearly ten times as numerous as the deaths from the same cause in all Scotland and Ireland put together.

It would be a simple waste of time to set forth here the evidence of the protective value of vaccination against smallpox. Men who stand up at meetings and, in the teeth of facts, assert that it is a matter of indifference as regards the liability of an individual to smallpox whether or not he has been vaccinated, or who even go the length of asserting that vaccination has increased smallpox mortality, are either grossly ignorant of the subject on which they speak or are speculating on the ignorance and credulity of their hearers. That vaccination is not an absolute protection against smallpox is admitted on all hands; but it is equally a matter of incontrovertible experience that the great majority of the vaccinated are thereby saved from smallpox altogether, while in the minority who contract it the disease is so modified that, with few exceptions, it occasions no risk of disfigurement or of death. If we would recall the dreadful state of things from which we have been rescued by Jenner's beneficent discovery, we have but to observe what is now going on in parts of the world where that discovery has hardly yet been introduced. We have it on the authority of an officer recently returned from Japan, that there the amount of blindness left by smallpox is a noticeable feature of the population; and Dr. Pringle informs us that in parts of India situate between the Ganges and the Jumna, in which vaccination is little practised, he found that 95 per cent. of the population had suffered from smallpox, that in 60 per cent. the marks were evident upon the face, and that the fatality of the disease among children was such that no child was considered a permanent member of the family, or had any provision made for its establishment or maintenance, until it had passed safely through the ordeal.

Another assertion that need not detain us is that vaccination, if it saves from smallpox, effects after all no real saving of human life, for that the children who are saved die of other diseases. Of course they do. Vaccination does not profess to confer immortality. It saves from a single disease only; and, in order to save from other diseases, other sanitary precautions must be had recourse to. And if it were as true as it is diametrically the reverse of truth that since the discovery of vaccination the mortality of children had increased 30 per cent., a great deal more would still be necessary in order to establish any connection between the two. The public may, however, be quite easy about this part of the question; for nothing is better made out than that since the introduction of vaccination the general death-rate—altogether irrespective of smallpox—has not increased, but diminished; and as one of the statements recently put forth to create alarm has been that vaccine lymph is itself the matter of consumption, it is especially satisfactory to know that not only has the general death-rate diminished, but that the death-rate from consumption has diminished in a marked degree.

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* From the *Times* of August 9.

There is, however, one aspect of the vaccination question which we think really important, and that has reference to the precautions to be taken against the various accidents which undoubtedly may render dangerous a process that is in itself free from danger. If parents are compelled to have their children vaccinated, some security is surely needed for the competency of those on whom the duty of vaccinating devolves, as well as for the maintenance, in a pure and active state, of the material with which the operation is performed; and it certainly is of high importance to be assured that these things are not left to chance. Now, the Legislature has itself provided one security in requiring that vaccination shall always be performed by a legally-qualified medical practitioner; but, with regard to those members of the profession who hold office as public vaccinators, an additional precaution is taken. No one can now hold such office without having given proof that he has studied vaccination practically under the most advantageous circumstances; that he can not only vaccinate skilfully, but that he can select, and give reasons for preferring, the children that are most fitted to furnish lymph; and that he is generally well acquainted with all the bearings of the subject. We have reason further to know that for years past the maintenance of effective vaccination and the providing supplies of pure lymph have been objects specially cared for by the Medical Department of the Privy Council. Under its auspices, both for avoiding occasion of fear on the part of parents, and also that the quality of lymph most protective against smallpox may be obtained, the public arrangements are particularly directed to the performance of vaccination, wherever practicable, direct from child to child, under circumstances which sufficiently admit of the selection of proper children to be used as vaccinifers. The parent, moreover, has thus the opportunity of seeing the child from whose arm her own child is vaccinated, and can make any inquiries about it that she sees fit. Every public vaccinator is also required to keep a record of the source whence the lymph used by him in every case is derived, and of the particular child from whose arm it was taken. Add to this that the proceedings of public vaccinators are systematically inspected, and that further special inquiries are at once made, not merely when there is direct complaint (which does not happen so often as once a year, or once in half a million of vaccinations), but whenever there is indirect information of anything amiss. It is remarkable that in the two recent cases of inquests on children who died of erysipelas consequent upon vaccination, or upon attempts to vaccinate, the operators were not public vaccinators, and we can hardly note this fact without being reminded of a suggestion already made in these columns, that it would be a change for the better to place the whole vaccination of the country in the hands of public officials, who should, of course, be debarred from other forms of practice. The arrangements at present made by the Privy Council appear to us to imply that, in seeking public vaccination, parents have every possible security for the safe and proper performance of the operation.

MICHAEL FARADAY.

BY DR. H. BENCE JONES, F.R.S.*

Æt. 61 (1853).

Early in the year he gave a Friday discourse on observations on the Magnetic Force, and he delivered the last lecture of the season on MM. Boussingault, Fremy, and Becquerel's experiments on oxygen.

He gave five reports to the Trinity House—on a comparison of the French lens and Chance's lens; on the lightning-rods at Eddystone and Bishop's Lighthouses; on the ventilation of St. Catherine and the Needles Lighthouses, and that at Cromer; and on fog-signals. A Company was formed to carry out Watson's electric light, but no trial of it took place.

In June he sent to the *Athenæum* an experimental investigation of table-moving. At the end he says, "I must bring this long description to a close. I am a little ashamed of it, for I think in the present age and in this part of the world it ought not to be required. Nevertheless, I hope it may be useful. There are many whom I do not expect to convince, but I may be allowed to say that I cannot undertake to answer such objections as may be made. I state my own convictions as an experimental philosopher, and find it no more necessary to enter into controversy on this point than on any other in science (as the nature of matter, or inertia, or the magnetization of light) on which I may differ from others. The world will decide sooner or later in all such cases, and I have no doubt very soon and correctly in the present instance."

A month later he writes to Professor Schönbein:—

"I have not been at work except in turning the tables upon the table turners. Nor should I have done that, but that so many inquiries poured in upon me that I thought it better to stop the inpouring flood by letting all know at once what my views and thoughts were. What a weak, credulous, incredulous, unbelieving, superstitious, bold, frightened—what a ridiculous world ours is as far as concerns the mind of man! How full of inconsistencies, contradictions, and absurdities it is! I declare that, taking the average of many minds that have recently come before me (and apart from that spirit which God has placed in each), and accepting for a moment that average as a standard, I should far prefer the obedience, affections, and instinct of a dog before it. Do not whisper this, however, to others. There is One above who worketh in all things, and who governs even in the midst of that misrule to which the tendencies and powers of men are so easily perverted."

After this year, as Director of the Laboratory and Superintendent of the House, he received £300 from the Royal Institution.

He was made Foreign Associate of the Royal Academy of Sciences, Turin, and Honorary Member of the Royal Society of Arts and Sciences, Mauritius.

Æt. 62 (1854).

At the end of this year, he sent a long paper to the "Philosophical Magazine" on some points of magnetic philosophy. He begins saying—"Within the last three years, I have been bold enough, though only as an experimentalist, to put forth new views of magnetic action in papers having for titles, 'On Lines of Magnetic Force,' Phil. Trans., 1852; and 'On Physical Lines of Magnetic Force,' Phil. Mag., 1862. I propose to call the attention of experimenters in a somewhat desultory manner to the subject again, both as respects the deficiency of the present physical views, and the possible existence of lines of physical force."

A course of lectures on education was given by different eminent men at the Royal Institution. Prince Albert came to Faraday's "Observations of Mental Education" on the 6th of May. In reprinting them, he said, "They are so immediately connected in their nature and origin with my own experimental life, considered either as cause or consequence, that I thought the close of this volume (of 'Researches on Chemistry and Physics') not an unfit place for their reproduction." He ends his lecture by saying, "My thoughts would flow back amongst the events and reflections of my past life, until I found nothing present itself but an open declaration—almost a confession—as a means of performing the duty due to the subject and to you."

He gave two Friday discourses on Electric Induction, associated cases of Current and Static Effects; and on Magnetic Hypotheses.

The Parliamentary Committee of the British Association applied to him through Lord Wrottesley for his opinion, whether any and what measures could be adopted by the Government or the Legislature to improve the position of science, or of the cultivators of science in this country. He answers, "I feel unfit to give a deliberate opinion. My course of life, and the circumstances which make it a happy one for me, are not those of persons who conform to the usages and habits of society. Through the kindness of all, from my Sovereign downwards, I have that which supplies all my need; and, in respect of honours, I have, as a scientific man, received from foreign countries and sovereigns those which, belonging to very limited and select classes, surpass, in my opinion, anything that it is in the power of my own to bestow.

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* Continued from page 518.

"I cannot say that I have not valued such distinctions; on the contrary, I esteem them very highly, but I do not think I have ever worked for or sought them. Even were such to be now created here, the time is passed when these would possess any attraction for me, and you will see, therefore, how unfit I am, upon the strength of any personal motive or feeling, to judge of what might be influential upon the minds of others. Nevertheless, I will make one or two remarks which have often occurred to my mind. . . . . A Government should, *for its own sake*, honour the men who do honour and service to the country. The aristocracy of the class should have distinctions which should be unattainable except to that of science. . . . . But, besides, the Government should, in the very many cases which come before it having a relation to scientific knowledge, employ men who pursue science, provided they are also men of business. This is, perhaps, now done to some extent, but to nothing like the degree which is practicable with advantage to all parties. The right means cannot have occurred to a Government which has not yet learned to approach and distinguish the class as a whole."

He sent five reports to the Trinity House, one of which, in two parts, was on Dr. Watson's electric light (voltaic), and on Professor Holmes's electric light (magneto-electric). The conclusion was that he could not recommend the electric light, that it had better be tried for other than lighthouse uses first. To Dr. Watson he wrote that he "could not put up in a lighthouse what has not been perfectly established beforehand, and is only experimental."

He was made Corresponding Associate of the Royal Academy of Sciences, Naples.

Æt. 63 (1855).

His first Friday discourse was on some Points of Magnetic Philosophy and on Gravity. Later he gave a discourse on Electric Conduction; and another on Ruhmkorff's Induction-apparatus.

For the Trinity House he only went to Birmingham to examine some apparatus of Chance's.

This year, on the application of his friend M. Dumas, he was made Commander of the Legion of Honour, and received the Grand Medal of Honour of the French Exhibition for his discoveries.

He was made Honorary member of the Imperial Society of Naturalists, Moscow, and Corresponding Associate of the Imperial Institute of Sciences of Lombardy.

Æt. 64 (1856).

This year he sent to the Royal Society his last paper, Experimental Relations of Gold (and other metals) to Light. It was read as the Bakerian lecture early the following year.

"At one time I had hoped that I had altered one coloured ray into another by means of gold, which would have been equivalent to a change in the number of undulations; and though I have not confirmed that result as yet, still those I have obtained seem to me to present a useful experimental entrance into certain physical investigations respecting the nature and action of a ray of light. I do not pretend that they are of great value in their present state, but they are very suggestive, and they may save much trouble to any experimentalist inclined to pursue and extend this line of investigation."

He gave two Friday discourses, the first on certain magnetic actions and affections; and the second on M. Petitjean's process for silvering glass, and some observations on divided gold.

He gave five reports to the Trinity House, and he entered into an engagement regarding the Board of Trade Lighthouses, and made four reports, two on Cape Race Lighthouse, and one on Dr. Normandy's distilled-water apparatus.

He was made Corresponding Member of the Netherland Society of Sciences, Batavia, and Member of the Imperial Royal Institute of Padua.

Æt. 65 (1857).

Two Friday discourses were given, the first on the Conservation of Force, and the second on the relations of Gold to Light.

"Various circumstances," he begins, "induce me at the present moment to put forth a consideration regarding the conservation of force...... There is no question which lies closer to the root of all physical knowledge than that which inquires whether force can be destroyed or not...... Agreeing with those who admit the conservation of force to be a principle in physics as large and sure as that of the indestructibility of matter, or the invariability of gravity, I think that no particular idea of force has a right to unlimited and unqualified acceptance that does not include assent to it..... Supposing the truth of the principle is assented to, I come to its uses. No hypothesis should be admitted nor any assertion of a fact credited that denies the principle..... The received idea of gravity appears to me to ignore entirely the principle of the conservation of force, and by the terms of its definition, if taken in an absolute sense, '*varying* inversely as the square of the distance,' to be in direct opposition to it."

To Mr. Barlow he writes:—

"I am in town, and at work more or less every day. My memory wearies me greatly in working; for I cannot remember from day to day the conclusions I come to, and all has to be thought out many times over. To write it down gives no assistance, for what is written down, is itself forgotten. It is only by very slow degrees that this state of mental muddiness can be wrought either through or under; nevertheless I know that to work somewhat, is far better than to stand still, even if nothing comes of it. It is better for the mind itself—not being quite sure whether I shall ever end the research, and yet being sure that, if in my former state of memory, I could work it out in a week or two to a successful result."

He gave six reports to the Trinity House. The most important was on Holmes's magneto-electric light, which was put up at Blackwall, and observed from Woolwich, and compared with a Fresnel lamp in the centre of a Bishop's lens, and also in the focus of a parabolic reflector. He critically examined the cost of the apparatus, the price of the light, the suppositions regarding its intensity and advantages, and the proposition to put one up in a lighthouse. He agreed to its being tried at the South Foreland.

He was made Member of the Institute of Breslau, Corresponding Associate of Institute of Sciences, Venice, and Member of the Imperial Academy, Breslau.

Æt. 66 (1858).

He wrote a short paper on Regelation, which he sent with a letter to Dr. Tyndall on Ice of Irregular Fusibility. These were printed in Dr. Tyndall's paper on some Physical Properties of Ice in the Philosophical Transactions for this year.

He gave two Friday discourses. The first was remarks on Static Induction; and the other on Wheatstone's Electric Telegraph in relation to Science (being an argument in favour of the full recognition of science as a branch of education).

This year Prince Albert offered him a house on Hampton Court Green. It required repair, and he doubted whether he could afford to do it up.

He writes to a niece:—

"The case is settled. The Queen has desired me to dismiss all thoughts of the repairs, as the house is to be put into thorough repair both inside and out. The letter from Sir C. Phipps is most kind."

To Sir C. Phipps he writes:—

"I find it difficult to write my thanks or express my sense of the gratitude I owe to Her Majesty; first, for the extreme kindness which is offered to me in the use of the house at Hampton Court, but far more for that condescension and consideration which, in respect of personal rest and health, was the moving cause of the offer. I feared that I might not be able properly to accept Her Majesty's most gracious favour. I would not bring myself to decline so honourable an offer, and yet I was constrained carefully to consider whether its acceptance was consistent with my own particular and peculiar circumstances. The enlargement of Her Majesty's favour has removed all difficulty. I accept with deep gratitude, and I hope that you will help me to express fitly to Her Majesty my thanks and feelings on this occasion."

To M. De la Rive he thus writes on the death of Mrs. Marcet:—

"Your subject interested me deeply every way, for Mrs. Marcet was a good friend to me, as she must have been to many of the human race. I entered the shop of a bookseller and bookbinder at the age of 13 in the year 1804, remained there eight years, and during the chief part of the time bound books. Now it was in those books in the hours after work that I found the beginning of my philosophy. There were two that especially helped me, the 'Encyclopædia Britannica,' from which I gained my first notions of electricity, and Mrs. Marcet's 'Conversations on Chemistry,' which gave me my foundation in that science.

"Do not suppose that I was a very deep thinker, or was marked as a precocious person. I was a very lively imaginative person, and could believe in the Arabian Nights as easily as in the Encyclopædia; but facts were important to me and saved me; I could trust a fact, and always cross-examined an assertion. So when I questioned Mrs. Marcet's book by such little experiments as I could find means to perform, and found it true to the facts as I could understand them, I felt that I had got hold of an anchor in chemical knowledge, and clung fast to it. Thence my deep veneration for Mrs. Marcet: first, as one who had conferred great personal good and pleasure on me, and then as one able to convey the truth and principle of those boundless fields of knowledge which concern natural things to the young, untaught, and inquiring mind.

"You may imagine my delight when I came to know Mrs. Marcet personally; how often I cast my thoughts backwards, delighting to connect the past and the present; how often, when sending a paper to her as a thank-offering, I thought of my first instructress; and such like thoughts will remain with me.

"I have some such thoughts even as regards your own father, who was, I may say, the first who personally at Geneva, and afterwards by correspondence, encouraged, and, by that, sustained me."

He made twelve reports to the Trinity House. The most important was on the electric light at the South Foreland. He went there, with a Committee of the Trinity House, to see it from sea and land. The light was in the centre of the Fresnel apparatus, in the upper light, as a fixed light, and so comparable with the lower fixed light, which consisted of oil-lamps and reflectors. They went to the Varne light-ship. The upper was generally inferior to the lower light. Next morning they went to the lighthouse, and examined it by day and also at night.

He was made Corresponding Member of the Hungarian Academy of Sciences, Pesth.

Æt. 67 (1859).

He gave two Friday discourses on Schönbein's Ozone and Antozone; and on Phosphorescence, Fluorescence, &c. He sent eleven reports to the Trinity House, and one to the Board of Trade. On the 28th of March, the magneto-electric light was again exhibited at the South Foreland. On the 20th of April he went to sea to examine it. "The upper light," he says, "is far superior to the lower light; the electric light very fine." He visited the lighthouse; he found new lamps by Duboscq, and silvered reflectors behind.

He writes:—"As a light unexceptionable; as electric light wonderful." He had before drawn up instructions to lighthouse keepers and pilot cutters; and on the 29th of April he reports the sufficiency of the light as established.

He reported this year on Way's mercurial electric light; the one advantage it had was that the place of the light was unchangeable.

He was one of a Commission appointed to consider the subject of lighting public galleries by gas; and he reported favourably on the experimental attempt at the Sheepshanks Gallery.

To Mr. Barlow he writes from Hampton Court:—"As I have been out here with only runs into town, I really know very little of what is going on there, and what I learn I forget. The Senate of the University accepted and approved of the report of the Committee for Scientific Degrees; so that that will go forward (if the Government approve) and will come into work next year. It seems to give much satisfaction to all who have seen it, though the subject is beset with difficulties; for when the depth and breadth of science came to be considered, and an estimate was made of how much a man ought to know to obtain a right to a degree in it, the amount in words seemed to be so enormous as to make me hesitate in demanding it from the student; and though in the D.S. one could divide the matter and claim eminence in one branch of science rather than good general knowledge in all, still in the B.S., which is a progressive degree, a more extended, though a more superficial acquaintance seemed to be required. In fact the matter is so new, and there is so little that can serve as previous experience in the founding and arranging these degrees, that one must leave the whole endeavour to shape itself as the practice and experience accumulates."

Æt. 68 (1860).

He gave two Friday discourses on Lighthouse Illumination by the Electric Light; and on the Electric Silk-loom.

He gave eleven reports to the Trinity House, and he examined three Red-Sea lighthouses for the Board of Trade. On the 13th of February he went to Dover, but was prevented by snow from reaching the lighthouse; on the 17th he tried again, and on the 28th he gave his final report on the practicability and utility of the magneto-electric light. He says, "Hope it will be applied." On the 14th of March the magneto-electric light was proposed for Dungeness. On the 21st he gives his reply, and says there is no difficulty.

He was appointed with Sir Roderick Murchison to report upon the means of preserving the stonework of the New Palace at Westminster.

At Christmas he gave his last course of juvenile lectures on the chemical history of a candle.

He was made Foreign Associate of the Academy of Sciences, Pesth, and Honorary Member of the Philosophical Society of Glasgow.

He resumed the office of Elder in his Church in the autumn, and in little more than three years and a half he finally resigned it.

Æt. 69 (1861).

He gave Friday discourses on Platinum, and on Warren De La Rue's Photographic Eclipse results.

He gave ten reports to the Trinity House. The most important work was a visit on the 31st of October to Dungeness, to see the new magneto-electric lamps, the machines, and the steam-engines. He drew up forms of observations to be made at Dungeness, at other lighthouses, and by the pilot cutters.

To Prof. Schönbein he writes:—"You really startle me with your independent antozone. . . . Surely you must hold it in your hand like a little struggler; for, if I understand you rightly, it must be a far more abundant body than cæsium. For the hold you have already obtained over it I congratulate you, as I would do if you had obtained a crown, and more than for a new metal. But surely these wonderful conditions of existence cannot be confined to oxygen alone. I am waiting to hear that you have discovered like parallel states with iodine, or bromine, or hydrogen, and nitrogen—what of nitrogen? is not its apparent quiet simplicity of action all a sham? not a sham, indeed; but still not the only state in which it can exist. If the compounds which a body can form show something of the state and powers it may have when isolated, then what should nitrogen be in its separate state? You see I do not work; I cannot; but I fancy, and stuff my letters with such fancies (not a fit return) to you."

In another letter he says, "I am still dull, stupefied, and forgetful. I wish a discovery would turn up with me, that I might answer you in a decent, respectable way; but it will not."

Still later he says:—"I look forward to your new results with great interest; but I am becoming more and more timid when I strive to collate hypotheses relating to the chemical constitution of matter. I cannot help thinking sometimes whether there is not some state or condition of which our present notions give us very little idea, and which yet would reveal to us a flood, a world of real knowledge,—a world of facts available both by practical application and their illustrations of first principles; and yet I cannot shape the idea into a definite form, or reach it by any trial facts that I can devise; and that being the case, I drop the attempt and imagine that all the preceding thought has just been a dreaminess and no more; and so there is an end of it."

In October he wrote to the Managers of the Institution:—"It is with the deepest feeling that I address you. I entered the Royal Institution in March 1813, nearly forty-nine years ago, and, with the exception of a comparatively short period, during which I was abroad on the continent with Sir H. Davy, have been with you ever since. During that time I have been most happy in your kindness, and in the fostering care which the Royal Institution has bestowed upon me. Thank God, first, for all his gifts. I have next to thank you and your predecessors for the unswerving encouragement and support which you have given me during that period. My life has been a happy one, and all I desired. During its progress I have tried to make a fitting return for it to the Royal Institution, and through it to science. But the progress of years (now amounting in number to three-score and ten) having brought forth first the period of development, and then that of maturity, have ultimately produced for me that of gentle decay. This has taken place in such a manner as to make the evening of life a blessing; for whilst increasing physical weakness occurs, a full share of health free from pain is granted with it, and whilst memory and certain other faculties of the mind diminish, my good spirits and cheerfulness do not diminish with them.

"Still I am not able to do as I have done. I am not competent to perform as I wish the delightful duty of teaching in the Theatre of the Royal Institution, and I now ask you (in consideration for me) to accept my resignation of the juvenile lectures. Being unwilling to give up what has always been so kindly received and so pleasant to myself, I have tried the faculties essential for their delivery, and I know that I ought to retreat; for the attempt to realize (in those trials) the necessary points brings with it weariness, giddiness, fear of failure, and the full conviction that it is time to retire; I desire therefore to lay down this duty. I may truly say that such has been the pleasure of the occupation to me, that my regret must be greater than yours need or can be.

"And this reminds me that I ought to place in your hands the whole of my occupation. It is no doubt true that the juvenile lectures, not being included in my engagement as professor, were when delivered by me undertaken as an extra duty, and remunerated by an extra payment. The duty of research, superintendence of the house, and of other services still remains; but I may well believe that the natural change which incapacitates me from lecturing, may also make me unfit for some of these. In such respects, however, I will leave you to judge, and to say whether it is your wish that I should still remain as part of the Royal Institution. I am, gentlemen, with all my heart, your faithful and devoted servant."

Shortly afterwards he wrote to the Secretary:—"You know my feelings, in regard to the exceedingly kind manner in which the Board of Managers received my letter, and *you* therefore can best convey to them my deep thanks on this occasion. Please do this for me. Nothing would make me happier in the things of this life than to make some scientific discovery or development, and by that to justify the Board in their desire to retain me in my position here."

Sir Emerson Tennant wished Mr. Faraday to witness the phenomena produced by Mr. Home. Mr. Faraday says, in his reply, "You will see that I consent to all this with much reserve and only for your sake." Three days afterwards Sir E Tennant says, "As Mr. Home's wife is dying, the probability is that the meeting, at which I wished you to be present, on the 24th may not take place. From the same cause I am unable to see Mr. Home previously, or to make the inquiries of himself necessary to satisfy the queries in your letter."

He was made Honorary Member of the Medical Society of Edinburgh.

Æt. 70 (1862).

On the 20th of June he gave his last Friday discourse, on Gas furnaces.

He gave seventeen reports to the Trinity House, and two to the Board of Trade. The most important of the Trinity House reports were still on the magneto-electric light. On the 12th of February he went to Dungeness, examined the engine-room, the machines, the lanthorn, the lamps, and the photometric effects. The keepers he examined, and found them not intelligent enough. At night he went to sea, testing at five miles off the effects of oil-lamp reflectors and the electric light, Professor Holmes himself being in charge of the lamps for the trials. Then he went to the Varne floating-light, and compared Dungeness, Grisnez, and the South Foreland lights. In the morning he went to Dover to examine the upper South Foreland new hydrostatic lamp; and, in the course of the year, the different observations made at South Foreland, Varne, Dungeness, and the pilot-cutters had to be considered and reported on. The House of Commons this year called for copies of his reports on the magneto-electric light to be printed. At the International Exhibition he saw Berlio's magneto-electric machine and light, and he reported on the construction of it.

This year he was examined at great length by the Public School Commissioners. His most important answers were these:—"that the natural knowledge which had been given to the world in such abundance during the last fifty years, I may say, should remain untouched, and that no sufficient attempt should be made to convey it to the young mind, growing up and obtaining its first views of these things, is to me a matter so strange that I find it difficult to understand; though I think I see the opposition breaking away; it is yet a very hard one to be overcome. That it ought to be overcome I have not the least doubt in the world." In answer to the question at what age it might be serviceable to introduce the physical sciences, he says, "I think one can hardly tell that until after experience for some few years. All I can say is this, that at my Juvenile Lectures, at Christmas time, I have never found a child too young to understand intelligently what I told him: they came to me afterwards with questions which proved their capability."

Again he says, "I do think that the study of natural science is so glorious a school for the mind, that with the laws impressed on all created things by the Creator, and the wonderful unity and stability of matter and the forces of matter, there cannot be a better school for the education of the mind."

In September he wrote his last letter to Prof. Schönbein; he says, "Again and again I tear up my letters, for I write nonsense. I cannot spell or write a line continuously. Whether I shall recover this confusion, I do not know. I will not write any more. My love to you."

The Duke of Devonshire at his installation would have the University of Cambridge confer the degree of LL.D. on Faraday. He was also made Knight Commander of the Order of St. Maurice and Lazarus, Italy.

Æt. 71 (1863).

He made twelve reports to the Trinity House. In February he was again at Dungeness examining a new optic apparatus, and comparing the reflectors with the electric light, and new and old apparatus. He reported on the observations regarding the magneto-electric light, and on a French application to the Board of Trade about the magneto-electric light.

To the Registrar of the London University he wrote:—"Many of your recent summonses have brought so vividly to my mind the progress of time in taking from me the power of obeying their call, that I have at last resolved to ask you to lay before the Senate my desire to relinquish my station, and render up that trust of duty which I can no longer perform with satisfaction either to myself or to others.

"The position of a Senator is one that should not be held by an inactive man to the exclusion of an active one. It has rejoiced my heart to see the progress of the University and of education under its influence and power; and that delight I hope to have so long as life shall be spared to me."

He was made Foreign Associate of the Imperial Academy of Medicine, Paris.

Æt. 72 (1864).

Twelve reports were made between January and October to the Trinity House. One was on a new magneto-electric machine; another on drawings, proposals, and estimates for the magneto-electric light at Portland. He made seven examinations of white and red leads, and two examinations of waters from Orfordness and the Fog-gun station, Lundy Island; and he reported on two 4th-order lights for the River Gambia.

He replied to an invitation of the Messrs. Davenport:—"I am obliged by your courteous invitation; but really I have been so disappointed by the manifestations to which my notice has at different times been called, that I am not encouraged to give any more attention to them, and therefore I leave those to which you refer in the hands of the Professors of Legerdemain. If spirit communications, not utterly worthless, should happen to start into activity, I will leave the spirits to find out for themselves how they can move my attention. I am tired of them."

A few weeks later he replied to another different invitation:—

"Whenever the spirits can counteract gravity or originate motion, or supply an action due to natural physical force, counteract any such action,—whenever they can pinch or prick me, or affect my sense of feeling or any other sense, or in any other way act on me without my waiting on them, or, working in the light, can show me a hand, either writing or not, or in any way make themselves visibly manifest to me—whenever these things are done, or anything which a conjuror cannot do better, or, rising to higher proofs, whenever the spirits describe their own nature, and, like honest spirits, say what they can do, or pretending, as their supporters do, that they can act on ordinary matter whenever they initiate action, and so make *themselves* manifest,—whenever by such-like signs they come to me and ask my attention to them, I will give it. But until some of these things be done, I have no more time to spare for them or their believers, or for correspondence about them."

At the end of the year he was asked by Mr. Cole to be a Vice-President of the Albert Hall. He replied:—"I have just returned from Brighton, to which place my doctor had sent me under nursing care. Hence the delay in answering your letter, for I was unaware of it until my return. Now, as to my acceptance of the honour you propose to me. With my rapidly failing faculties, ought I to accept it? You shall decide. Remember that I was obliged to decline lecturing before Her Majesty and the Royal Family at Osborne; that I have declined and am declining the Presidency of the Royal Society, the Royal Institution, and other bodies; declaring myself unfit to undertake any responsibility or duty even in the smallest degree. Would it not therefore be inconsistent to allow my name to appear amongst those of the effectual men who delight, as I should have done under other circumstances, to honour in every way the memory of our most gracious and regretted leader? These are my difficulties. It is only the name and the remembrance of His Royal Highness which would have moved me from a long-taken resolution."

Mr. Cole decided, "without a moment's doubt," that he was to be a Vice-President.

To a friend he writes:—"I find myself less and less fit for communication with society, even in a meeting of family—brothers and sisters. I cannot keep pace in recollection with the conversation, and so have to sit silent and taciturn. Feeling this condition of things, I keep myself out of the way of making an exposure of myself."

He was made Foreign Associate of the Royal Academy of Science, Naples.

Æt. 73 (1865).

He made his last report for the Trinity House in May this year on St. Bees Light.

He wrote to the Deputy Master:—"I write to put myself plainly before you in respect of the matter about which I called two days ago. At the request of the then Deputy Master I joined the Trinity House in February, 1836, now near upon thirty years since. I find that time has had its usual effect upon me, and that I have lost the power of remembering and also of other sorts, and I desire to relieve my mind. Can this be done without my retiring altogether, and can you help me in this matter?"

In looking back to his work for the Trinity House, going down to analyses of cottons, oils, paints, and waters, and recalling his words "that £200 a year is quite enough in itself, but not if it is to be the indicator of the character of the appointment," one is rejoiced to find that he received the highest reward which the scientific man can obtain. After himself testing the results by the most complete and searching trials, he was able to recommend that his own grandest discovery should be applied to "the great object of guiding the mariner across the dark and dreary waste of waters."

To the Managers of the Royal Institution he wrote, March 1:—

"Unless it be that as I get older I become more infirm in mind, and consequently more timid and unsteady, and so less confident in your warm expressions, I might, I think, trust more surely in your resolution of the 2nd of December, 1861, and in the reiterated verbal assurances of your kind Secretary than I do; but I become from year to year more shaken in mind, and feel less able to take any responsibility on me. I wish, therefore, to retire from the position of Superintendent of the house and laboratories. That which has in times past been my chiefest pleasure has now become a very great anxiety; and I feel a growing inability to advise on the policy of the Institution, or to be the one referred to on questions both great and small as to the management of the house.

"In a former letter, when laying down the juvenile lectures, I mentioned 'that other duties, such as research, superintendence of the house, and other services still remain;' but I then feared that I might be found unfit for them; I am now persuaded that this is the case. If under these circumstances you may think that with the resignation of the positions I have thus far filled the rooms I occupy should be at liberty, I trust that you will feel no difficulty in letting me leave them; for the good of the Institution is my chief desire in the whole of this action. Permit me to sign myself personally, your dear, indebted, and grateful friend."

"Resolved unanimously—

"That the Managers thank Professor Faraday for the scrupulous anxiety which he has now and ever shown to act in every respect for the good of the Royal Institution. They are most unwilling that he should feel that the cares of the laboratories and the house weigh upon him. They beg that he will undertake only so much of the care of the house as may be agreeable to himself, and that whilst relinquishing the duties of 'Director of the laboratory,' he will retain his home at the Royal Institution."

Sir David Brewster sent him a pamphlet on the Invention and Introduction of the Dioptric Lights, and asked him to give his opinion on the value and importance of these lights. He replied:—". . . . I would rather not enter as an arbitrator or judge into the matter, for I have of late been resigning all my functions as one incompetent to take up such matters, and the Royal Institution as well as the Trinity House have so far accepted them as to set me free from all anxiety and thought in respect to them. In fact my memory is *gone*, and I am obliged to refrain from reading argumentative matter or from judging of it. I am very thankful for their tenderness in the matter; and if it please Providence to continue me a year or two in this life, I hope to bear the decree patiently. My time for contending for temporal honours is at an end, whether it be for myself or others."

In the fine summer at Hampton Court he sat in his window delighting in the clouds and the holiday-people on the green. A friend from London asked him how he was. "Just waiting," he replied. This he more fully said in a note. "I bow before him who his Lord of all, and hope to keep waiting patiently for His time and mode of releasing me according to His divine word, and the great and precious promises whereby His people are made partakers of the divine nature."

To Sir James South, who wished to have some account of Anderson's services, Faraday wrote:—"Whilst endeavouring to fulfil your wishes in relation to my old companion, Mr. Anderson, I think I cannot do better than accompany some notes which he has himself drawn up and had printed, by some remarks of mine, which will show how and how long he has been engaged here.

"He came to assist in the glass house for the service of science in September 1827, where he remained working until about 1830. Then for a while he was retained by myself. In 1832 he was in the service of the Royal Institution, and paid by it. From that time to the present he has remained with that body, and has obtained their constant approbation.

In January 1842 they raised his pay to £100 per annum with praise. In 1847 they raised it in like manner to £110. For the same reason in 1853 they raised it to £120; and in 1860, in a minute, of which I think Mr. Anderson has no copy, they say that, in consideration of his now lengthened services and the diligence exhibited by him, they are of opinion that his salary should be raised to £130.

"Mr. Anderson still remains with us, and is in character what he has ever been. He and I are companions in years and in work and in the Royal Institution. Mr. Brande's testimony when he left the Institution is to the same purport as the others. Mr. Anderson was 75 years of age on the 12th of last month (January). He is a widower, but has a daughter keeping his house for him. We wish him not to come to the Royal Institution, save when he is well enough to make it a pleasure; but he seems to be happy being so employed."

Æt. 74 (1866).

Early in January Anderson died. Sir James South wished some monument to be put up to him, and wrote to Faraday. He replied:—"My dear old friend, I would fain write to you, but, indeed, write to no one, and have now a burn on the fingers of my right hand which adds to my trouble; so that I still use my dear J.'s hand as one better than my own, and fear I give her great work by so doing. She has, I understand, written to you this morning, and told you how averse I am to meddling with sepulchral honours in *any* case. I shall mention your good will to Anderson" [here Faraday took the pen, because his niece made some objection to the words "mention the good will to Anderson." who was dead]; "but I told them what are my feelings. I have told several what may be my own desire; to have a plain simple funeral, attended by none but my own relatives, followed by a gravestone of the most ordinary kind, in the simplest earthly place.

"As death draws nigh to old men or people, this world disappears, or should become of little importance. It is so with me; but I cannot say it simply to others [here he stopped his writing, and his niece finished the note], for I cannot write it as I would. Yours, dear old friend, whilst permitted."

The Society of Arts this summer gave him a medal for his scientific discoveries.

During the winter he became very feeble in all muscular power. Almost the last interest he showed in scientific things was in a Holtz electric machine.

In the spring, for a short time, with decreasing power, there was at times wandering of mind. One day he fancied he had made some discovery somehow related to Pasteur's dextro- and lævo-racemic acid. He desired the traces of it to be carefully preserved, for "it might be a glorious discovery."

His loss of power became more and more plain during the summer and autumn and winter: all the actions of the body were carried on with difficulty; he was scarcely able to move; but his mind continually overflowed with the consciousness of the affectionate care of those dearest to him.

Æt. 75 (1867).

At times he could hardly speak a word, and with difficulty swallow a mouthful.

In the spring he went to Hampton Court. Gradually he became more and more torpid, and on the 25th of August he died there.

He said of himself, "In early life I was a very lively imaginative person, who could believe in the Arabian Nights as easily as in the Encyclopædia. But facts were important to me and saved me. I could trust a fact." And so afterwards this blacksmith's son from Jacob's Well Mews, full of inborn religion, and gentleness, genius, and energy, searched for and trusted to facts in his experimental researches, and thus left to science a monument of himself that may be compared even to that of Newton. H. B. J.

Late last Tuesday night, the shop of Mr. G. W. Pratt, chemist, Cavendish-street, Manchester, was entered by burglars. No money was taken, but the unwelcome visitors carried off several articles.

ROBINSON'S CORN SOLVENT PENCIL, AND CONCENTRATED WATERS.

The Corn Solvent Pencils manufactured by Mr. Robinson, of Pendleton, Manchester, are the most elegant in shape and appearance which we have yet seen. They are sent out in three colours, and one dozen mounted on a card look very showy, while, as it is probable that about every other person who sees them will be a sufferer, it may fairly be presumed that a good proportion will be customers also. This shows that the pencils are likely to pay for showing.

We are very pleased to take this opportunity of calling the attention of the trade to this same gentleman's manufactures of Concentrated Waters. We have carefully examined the samples which have been sent to us, viz., Rose, Elder Flower, Orange Flower, Cinnamon, Peppermint, and Dill, by the side of waters distilled according to the Pharmacopœia directions, and also with water artificially prepared from essential oils, and we consider ourselves justified in saying that these concentrated waters, when diluted as directed, are at least superior to the imitations of medicinal waters allowed by the Pharmacopœia.

GEHRIG BROTHERS' ELECTRO-MOTOR TEETHING NECKLACE.

Under the above title, a somewhat unusual novelty has come to us from Germany. Singularly, certainly (whether fortunately or unfortunately we will not decide), our circle of acquaintance does not at present include any young lady or gentleman in such a condition as likely to render this necklace of service, or, at least, to give us an opportunity of fairly testing it. The agents, however, for this country (Messrs. Forbes, Born, & Co., of South Place, Finsbury, a firm of high reputation) inform us that in Germany the necklace is highly approved of by mothers of all classes, our own Princess Royal being numbered among its patrons, who have found its beneficial effects in the relief of their children's sufferings. We presume its name indicates the source of its supposed influence, but we do not profess to understand the principle of its construction.

Corner for Students.

CONDUCTED BY J. C. BROUGH, F.C.S.

The chemical formulæ employed in this section are based upon the new system of atomic weights, unless the use of the older system is specially indicated. In the *British Pharmacopœia* the symbols corresponding to those adopted here are printed in heavy Clarendon type. The chemical nomenclature generally used in this Corner for Students agrees with that adopted in the new edition of *Fownes's Manual of Chemistry*, which is recommended as a text-book.

PRIZE PAPER.

We again propose the production of a short paper as a task for our students. The subject to be treated is

THE MERCURIAL COMPOUNDS AND PREPARATIONS OF THE PHARMACOPŒIA.

The length of each paper should not exceed one column, and the writer's endeavour should be to convey as much useful information as possible in a carefully-written abstract of this length. In September the publication of questions and problems will be resumed.

PRIZES.

We have awarded the First Prize for the paper on Volumetric Analysis to

J. F. Brown, 37, Town Wall-street, Dover.

His essay far exceeds the length prescribed, but it is so clear and precise that we feel compelled to relax our regulations.

The Second Prize is awarded to

Joseph Young, 16, Gallowtree-gate, Leicester,

who has arranged his facts in a very systematic manner.

We print the two prize papers. We have received admirable papers from J. C. Thresh, J.W. Evans, and J. Gregory. The subject has been handled by D. Udall and John Tully with less striking results.

THE PHARMACOPŒIA SYSTEM OF VOLUMETRIC ANALYSIS.

Volumetric Analysis may be defined as the method based upon the observed reactions of measured volumes.

Its employment is directed in the British Pharmacopœia, in order to ascertain the strength and purity of some of the officinal chemicals and preparations.

Fifty-two of them are thus treated, and in each case, at the end of the paragraph headed "Characters and Tests," directions are given for the purpose.

Appendix III, entitled "Test Solutions for Volumetric Estimations," contains a description of the necessary apparatus, and the formulæ for the six solutions mentioned in body of the work.

It is essential that a volumetric solution should be of definite and invariable strength, and, for convenience sake, the weight of reagent in a given volume should be either an equivalent, its multiple, or submultiple, expressed in terms of some unit of weight.

In the Pharmacopœia, the alternative is offered of using either the British or the metric system of weights and measures; the grain and grain-measure of the former, and the gramme and cubic centimetre of the latter being selected as the most convenient units.

Since the grain-measure is, as its name implies, the volume occupied by a grain of distilled water, under the standard condition of temperature and pressure, and the cubic centimetre contains a gramme of distilled water, it is evident that the strength of the solution would be the same, whichever plan were adopted. For convenience sake, it is recommended to substitute one-tenth of the metric weight or measure for the grain, as thus the absolute quantities become more nearly alike, the decigramme and the grain, for example, being to one another as 3 to 2, or thereabouts. It is worth notice, that the standard temperature of the metric system is not 60° F., but 4° Cent. (= 39·2° F.), or nearly the point of maximum density of water; therefore the cubic centimetre of distilled water will not weigh quite 15·432 grains at the increased temperature of 60° F. (= 15·5° Cent.)

This is of moment only when it should be necessary to express quantities given in one notation in terms of the other.

The description of the necessary apparatus given in the Pharmacopœia is sufficiently clear and precise, but it may be noted that the addition of Mohr's clip and Erdmann's float will tend to increased accuracy and convenience. The former is a spring clip acting upon a short length of india-rubber tubing attached to the lower extremity of the burette, by pressing which with the finger and thumb, the flow of the liquid may be more easily regulated.

The float is a glass cylinder fitting easily into the burette, and terminating below in a small bulb weighted with mercury. A horizontal line is drawn round it, about midway, and as the float is immersed to nearly its own length in the fluid, this is easily brought to coincide with the zero of the burette, and when the reaction is complete, the same line marks the volume abstracted, free from the liability to error which otherwise arises from the attraction of the glass for the contained fluid.

The six solutions are the following:—

(1.) Of Oxalic Acid for Alkalimetry.—This is made with re-crystallized acid, and contains half an equivalent in grammes or grains in 1,000 cubic centimetres or grain-measures respectively. Since the acid is bibasic, this corresponds to an equivalent in grammes or grains of any alkali or bicarbonate of the alkaline bases. The Pharmacopœia wrongly states, "or alkaline carbonate;" normal carbonates, containing two atoms of the alkaline metal, require equivalent weights of the acid for their complete neutralisation. The most convenient method of using this and the following solutions, is to place the flask containing the liquid to be tested upon a sheet of white paper, add a little infusion of litmus, and drop in the solution from the burette, until neutrality is shown by the change of colour beginning to appear.

(2.) Of Soda for Acidimetry.—The method of making this, which is applied also to the solution of hyposulphite of soda, may be thus explained:—Make the solution of approximate strength, note the number of measures (n) used to produce a given effect; for every n measure either 1000 grain measures or 100 cubic centimetres are required; multiply the volume of the solution which remains by 1000 or 100, divide by n, and the quotient will be the volume to which it must be diluted.

(3.) Of Silver Nitrate. — This yields an insoluble cyanide, bromide, or arseniate of silver, with the substances which it is employed to test. Of the first of these, it may be remarked that as the precipitate ceases to be redissolved when exactly half the cyanogen has combined with the silver, the result of the test should be doubled to obtain the quantity of hydrocyanic acid actually present.

(4.) Of Iodine, dissolved by the aid of iodide of potassium, and employed to oxidize sulphurous acid and compounds of arsenic, the reaction is thus shown:—

$$H_2SO_3 + I_2 + H_2O = 2HI + H_2SO_4.$$

(5.) Of Hyposulphite of Soda, for estimating iodine, and, indirectly, chlorides, by means of the quantity of iodine which they are capable of liberating from potassium iodide in presence of hydrochloric acid.

Half the sodium of the hyposulphite is abstracted by the iodine, the remainder, with the hyposulphurous elements, forms tetrathionate of sodium. $Na_2S_4O_6$.

Equivalent weights of each are required to produce this effect, and upon this the test is based.

(6.) Of Red Chromate of Potash, for oxidizing ferrous salts, and thus indicating the amount of iron.

Its reaction with a solution of ferrous or protosalt of iron, acidulated with hydrochloric acid, is shown in the following equation:—

$$2Fe_3P_2O_8 + 14HCl + K_2Cr_2O_7 = 4FePO_4 + Fe2Cl_6 + 2\ KCl + Cr_2Cl_6 + 7H_2O.$$

In conclusion, permit me to point out two corrections in the text of the Pharmacopœia, not, I believe, before noticed. P. 397, 3rd line from bottom, insert Dil. after "Hydrocyan." p. 395, 2nd line from bottom, for "grains" read "grammes."

J. F. Brown.

THE VOLUMETRIC ANALYSIS OF THE BRITISH PHARMACOPŒIA.

Volumetric Analysis is the name of a process which has for its object the determination of the QUANTITY of some given constituent, which is known to be present in the article examined. It is so named because its computations are by VOLUMES or MEASURES of a definite solution of the reagent employed.

It is founded on the law, that bodies which enter into combination, do so only in certain definite proportions or equivalents—that these being given, the proportion necessarily combined with a known quantity of the test-agent may be accurately calculated therefrom.

Thus, one equivalent by weight in grains is dissolved and made up with Distilled Water at 60° F. to 1000 GRAIN MEASURES, which is the VOLUME of 1000 grains of Distilled Water at 60° F. (B.P.)

Solutions of this strength are termed "NORMAL," but for many pharmaceutical purposes, such solutions would be found inconveniently strong; hence the B.P. order a few "solutions," one tenth the strength of the above, known as DECINORMAL solutions $(\frac{N}{10})$.

If these proportions are always maintained, the metric or any other system of weights and measures may be used with the same results. Thus:—

To prepare NORMAL solutions, take of the reagent

1 eq. in Grammes	dissolve and make up with Aq. to the measure of	1000 C.C.	=	the Vol. of	1000 Gms.	of Aq. at	39°·2 Fah.	
10 eq. in Grains		10000 gr. mea.	=	,,	10000 Grs.	,,	60°	B.P. '67
8¾ eq. ,,		Imp. Pint.	=	,,	8750 ,,	,,	,,	,, '64
7 eq. ,,		Av'pois lb.	=	,,	7000 ,,	,,	62°	,,

The same relative proportion is here constantly preserved; therefore a solution made according to EITHER of the above systems will be IDENTICAL in strength, and consequently, if prepared with a due regard to the purity of the chemicals used and the accuracy with which they are weighed, equal VOLUMES of different solutions (capable of combination) will neutralize each other.

For DECINORMAL solutions ($\frac{N}{10}$) one-tenth of the equivalent quantities must be taken.

It is usual to divide volumetrical operations into three groups, viz.:—Analysis by SATURATION, REDUCTION, and PRECIPITATION.

I. Saturation Analysis, sometimes termed Alkalimetry and Acidimetry, is performed by gradually adding the test-solution to a given quantity of the article under examination, until neutralization is effected and indicated by litmus.

The Vol. Sols. of Soda and Oxalic Acid are the officinal solutions for this purpose, the former normal; and the latter, being bibasic, of half-normal strength.

II. Reduction or Oxidation is effected by a Vol. Sol. of some oxidizing body; the completion of the process being ascertained either by testing a few drops of the mixed solutions with some suitable test, that will give a coloured indication when enough Vol. Sol. has been employed, or, in some cases, when the colouring matter of the Vol. Sol. ceases to be discharged; also *vice versâ*, when a permanent colour appears in the two colourless solutions.

The Vol. Sols. of Bichromate of Potash ($\frac{N}{5}$), Iodine ($\frac{N}{10}$), and Hyposulphate of Soda ($\frac{N}{10}$), are the respective officinal solutions for this method.

III. Precipitation operations are known to be concluded when a precipitate begins to be formed after the addition of the necessary quantity of the clear Vol. Sol.; also when the precipitate ceases to be formed on the further addition of the determinative solution.

The Vol. Sol. of Nitrate of Silver ($\frac{N}{10}$) is the officinal preparation for this process, though in a few instances the Vol. Sol. of Oxalic Acid is the precipitating agent ordered.

Finally, the usual adaptation of Volumetrical Analysis, or a quantitative estimation of some given constituent, is not so much the intention of the B. P. as to point out a means whereby the strength and purity of certain of its preparations may be readily and accurately ascertained.

J. Young.

THE MONTH

THE NEXT GREAT EXHIBITION.

The following announcement has been made from the Office of Her Majesty's Commissioners for the Exhibition of 1851:—

Her Majesty's Commissioners for the Exhibition of 1851 announce that the first of a series of Annual International Exhibitions of selected Works of Fine and Industrial Art will be opened in London at South Kensington on Monday, the 1st of May, 1871, and be closed on Saturday, the 30th of September, 1871.

The Exhibitions will be held in permanent buildings, about to be erected, adjoining the arcades of the Royal Horticultural Gardens.

The productions of all nations will be admitted, subject to obtaining the certificate of competent judges that they are of sufficient excellence to be worthy of exhibition.

The objects in the first Exhibition will consist of the following classes, for each of which will be appointed a reporter and a separate committee:—

I. Fine Arts.

1. Paintings of all kinds, in oil, water colours, enamel, porcelain, etc.
2. Sculpture in marble, wood, stone, terra-cotta, metal, ivory, and other materials.
3. Engravings, lithography, photography, etc.
4. Architectural designs and models.
5. Tapestries, embroideries, lace, etc., shown for their fine art and not as manufactures.
6. Designs for all kinds of decorative manufactures.
7. Copies of ancient pictures, enamels, reproductions in plaster, electrotypes of fine ancient works of art, etc.

II. Scientific Inventions and New Discoveries of all kinds.

III. Manufactures.

a. Pottery of all kinds, including that used in building—viz., earthenware, stoneware, porcelain, parian, etc., with machinery and processes for the preparation of such manufactures.

b. Wool and worsted fabrics, with the raw produce and machinery for manufactures in the same.

c. Educational.

1. School buildings, fittings, furniture, etc.
2. Books, maps, globes, etc.
3. Appliances for physical training, including toys and games.
4. Specimens and illustrations of modes of teaching fine art, natural history, and physical science.

IV. Horticulture.

International Exhibitions of new and rare plants, and of fruits, vegetables, flowers, and plants showing specialities of cultivation, will be held by the Royal Horticultural Society in conjunction with the above Exhibitions.

In Classes II. and III. producers will be permitted to send one specimen of every kind of object they manufacture, such object being distinguished for novelty or excellence. Detailed rules applicable for each of the above classes and lists of the separate trades engaged in the production of objects of manufacture will be issued. Special rules for horticultural exhibitions will be issued by the Royal Horticultural Society.

The arrangement of the objects will be according to classes, and not nationalities as in former International Exhibitions.

One-third portion of the whole available space will be assigned absolutely to foreign exhibitors, who must obtain certificates for the admission of their objects from their respective Governments. Foreign countries will appoint their own judges. The remaining two-thirds of the space will be filled by objects produced either in the United Kingdom, or, if produced abroad, sent direct to the building for inspection and approval of judges selected for the British exhibitors. Objects not accepted for exhibition must be removed according to the notices given, but no objects exhibited can be removed until the close of the Exhibition.

All exhibitors or their agents must deliver at the building, into the charge of the proper officers, the objects unpacked and ready for immediate exhibition, and free of all charges for carriage, etc.

Her Majesty's Commissioners will find large glass cases, stands, and fittings, free of cost to the exhibitors, and, except in the case of machinery, carry out the arrangement of the objects by their own officers.

Her Majesty's Commissioners will take the greatest possible care of all objects, but they will not hold themselves responsible for loss or damage of any kind.

Prices may be attached to the objects, and exhibitors will be encouraged to state their prices. Agents will be appointed to attend to the interests of exhibitors.

Every object must be accompanied with a descriptive label, stating the special reason, whether of excellency, novelty, or cheapness, etc., why it is offered for exhibition.

Due notice will be given of the days for receiving each class of objects; and, to enable the arrangements to be carried into effect, strict punctuality will be required from all exhibitors, both foreign and British. Objects delivered after the days appointed fort heir reception cannot be received.

Reports of each class of objects will be prepared immediately after the opening, and will be published before the 1st of June, 1871.

Each foreign country will be free to accredit an official reporter for every class in which objects made in such country are exhibited, for the purpose of joining in the Reports.

There will be no prizes, but a certificate of having obtained the distinction of admission to the Exhibition will be given to each exhibitor.

A catalogue will be published in the English language, but every foreign country will be free to publish a catalogue in its own language if it think fit.

LIVERPOOL CHEMISTS' ASSOCIATION.

An excursion organised by this Association, including nearly the whole of the members and lady friends, proceeded to Chester on the 27th ult. On their arrival, the party proceeded to the lead works of Messrs. Walker, Parker, and Co. Here the various processes of this large manufactory were duly inspected: the making of shot, white lead, and lead piping. The shot tower is 168 feet high, and the process interesting. In the granulation of lead for shot a small portion of arsenic is added. The proportion is about 2 per cent. of the white or yellow arsenic. The compound is heated red hot for three hours in an iron pot protected by a tight cover, when the contents are let fall into a reservoir of water from a height of 10 to 150 feet, as the shot are to be coarser or finer; the altitude of Messrs. Walker and Parker's tower giving them a peculiar advantage. Samples of the shot made were distributed. After partaking of luncheon, the party had a most delightful sail up the river Dee—celebrated for its jolly miller—to Eaton Hall. On their return to the city, they sat down to an excellent dinner at the Hop Pole Inn, the President of the Association, Mr. Robinson, officiating as chairman. After dinner, the following toasts were proposed and drank:—"The Queen and Royal Family," "The Chemists' Association," "The Kindred Societies," "The Pharmaceutical Society," "The Drug Trade," "Messrs. Walker, Parker, and Co." A most enjoyable day was spent, and the party returned to Liverpool with lively feelings of satisfaction of their trip to the ancient city of Chester.

QUEKETT MICROSCOPICAL CLUB.

The fourth Annual General Meeting was held on Friday evening, the 6th inst., in the Library of University College, Arthur E. Durham, Esq., President, in the chair.

A report was read, which showed that 142 members had been elected since the last Annual Meeting, making a total of 512. The Treasurer's report showed that the finances of the club were in a very satisfactory condition.

In vacating the chair, which he had ably filled for two years, the President delivered a highly impressive address, which was listened to with marked atttention throughout. The following gentlemen were elected to fill the offices named for the ensuing year:—For President, Mr. P. Le Neve Foster; Vice-Presidents, Dr. R. Braithwaite, Mr. W. M. Bywater, Mr. A. E. Durham, Mr. H. F. Hailes; Members of Committee, Mr. T. Crooke, Mr. B. T. Lowne, Mr. S. J. McIntire, Dr. J. Matthews; for Treasurer, Mr. R. Hardwicke; for Hon. Secretary, Mr. T. Charters White; for Hon. Sec. for For. Corrs., Mr. M. C. Cooke.

A paper on the Ratio-micro-polariscope, by Mr. James J. Field, its inventor, was read, at the conclusion of which the instrument was exhibited. Ten new members were elected, and the proceedings then terminated.

PURE WATER.

One of the most important features in the proceedings of the British Medical Association, at the recent meeting held at Leeds, was an address by Sir William Jenner on "Medicine," in which he reviewed the knowledge of medicines and their uses. Adverting to the fact that typhoid fever and cholera are frequently generated by the use of polluted drinking water, Sir William boldly avowed that local authorities who supplied such water ought to be as amenable to actions for damages to persons whose health was injured thereby as railway companies are for injuries to passengers.

THE LYNN TRAGEDY.

At the Norfolk Assizes on the 9th inst., Mary Ann Langford was indicted for the wilful murder of her infant child, Charlotte Langford.

Mr. William Cooper and Mr. Abdy appeared for the prosecution; the prisoner was defended by Mr. O'Malley, Q.C., Mr. Metcalfe, and Mr. Ford.

The facts of the case were as follows:—The prisoner, who is also charged in another indictment with the murder of her husband, Albert Frederick Langford, had been married for some few years prior to this charge, and was the mother of several children. Her husband was a druggist in Norfolk-street, Lynn. He had been an invalid for two years past, and was latterly wholly incapacitated for business. The child whose death was the subject of this inquiry was about four months old. For some time previous to her last confinement the prisoner had been in very low spirits, partly from family reasons and partly on account of the supposed falling off of her husband's business. On the 27th of April she sent for her mother-in-law, Mrs. Susan Langford, who lived not far off, about 8 a.m., or a little before that time. Mrs. Langford, sen., obeyed the summons, and on her arrival her daughter-in-law said, in answer to her inquiries about Mr. Langford, "Oh dear, Mrs. Langford, he is very ill, and the baby too." Dr. Lowe, the family doctor, was immediately sent for, and on his arrival he found Mr. Langford, the husband, in strong tetanic convulsions, and the infant (then in its bed in another room) in convulsions also. In reply to Dr. Lowe's query about the time when the convulsions came on, the prisoner in a loud whisper said "Doctor, I have poisoned myself." "With strychnia?" said the doctor. Her answer was "Yes." "And your husband, too?" said he. Her answer was "Yes." Upon that she also was seized with convulsions. Another physician, Dr. Archer, was sent for, and these two gentlemen remained in attendance for the day. The child died about 6 p.m., having been in almost continuous convulsions throughout the day. A *post-mortem* examination was then made, and the viscera were sent to Dr. Letheby for examination, together with a dress worn by the prisoner, and a bottle containing about two ounces of pure strychnia, taken from a drawer in the shop, which drawer was not kept locked. It was proved among other things that the prisoner's husband had been for some time too ill to attend to his business, and that the prisoner used to go into the shop every day to get the money that was taken, and occasionally to sell small things like tobacco to the customers. The principal evidence was that given by the medical men, one of whom—Dr. Archer—was too ill to appear in court. The evidence of Drs. Lowe and Archer, by whom the *post-mortem* examination of the child had been made, and who also had seen the child before its death, showed that before its death there had been twitchings of the musles of the face and arms; that the fingers were rigidly bent, and the toes also; that the muscles of the abdomen were contracted; that it was convulsed at times strongly, five or six times in the day; that before and after death there were the general appearances in the body which are usually indicative of death by strychnia, and that it was treated for poisoning by strychnia. They also proved that the stomach and its contents were put into a jar, fastened down with a bladder, and sealed by them, and afterwards by the Coroner, in order that it might be conveyed intact to Dr. Letheby, by whom it was received at the same time that he received a gown belonging to and worn by the prisoner on the morning of the 27th of April, from the pocket of which a small portion of crystals of strychnia was taken.

Dr. Letheby: I received from a police constable a hamper. There were two jars and a wide-mouthed bottle containing a brown paper packet, sealed. The packet contained rather more than five and a-half grains of pure strychnia in a crystalline state. A dress was brought me at the same time. This is it. I cut the pocket out, examined it, and found about a third of a grain of strychnia. I took out of one jar the whole of the viscera of a child, the stomach, and its contents. I found on opening it a fluid ounce of a thick fluid, pap and milk. It was analysed, and I discovered very distinct traces of strychnia. I examined the liver, and from a portion of the liver I extracted something which I know to be strychnia by its bitter taste and its action on frogs. I have heard the evidence given by Drs. Lowe and Archer, and I believe the child's death to have been caused by strychnia. I found quite enough in the stomach to found the oxidisation test. I examined the brain and spinal cord, and found nothing there. I have heard Dr. Lowe's evidence with respect to the secretion of strychnia by the mother's milk. It is quite possible that may be so, but the mother must be under the influence of strychnia to have such an effect. The bitterness of the strychnia would affect the milk. The time of action of the strychnia depends on a great number of circumstances. It may be a few minutes, it may be two hours.

Cross-examined by Mr. O'Malley: The portion discovered in the stomach is the portion unabsorbed. The absorption from the stomach into the circulation may or may not go on until death is produced. In the case of a child I should expect it would go on very quickly. After it had received a full killing dose I should think half an hour more likely. Six hours would be the extreme limit. There was milk in the child's stomach. After evaporation and application of peroxide of manganese, I obtained the red and the violet colours which are the characteristics of strychnia. There is no other substance that would produce that colour by that test. My opinion is, that in cases of poisoning by strychnia we should find it in the stomach. My opinion still is that we ought to find it in the stomach. I remember reading a report of a case in the *Lancet*, by Dr. Harley, that the mother did communicate *nux vomica* through her milk to her child, by whom symptoms of poisoning by *nux vomica* were shown, and that after the discontinuance of the medicine in which the *nux vomica* was contained the symptoms ceased.

Dr. Taylor: I have heard the evidence in this case to-day, and from what I have heard I believe the child died from the effects of strychnia. I can see no other cause for the convulsions. It is quite possible that most poisons may find their way through the milk into a child, but it is very improbable, as they pass away through the urine and the excretions. I have listened to the evidence about the time the child lingered, and I never knew a similar instance of an infant living so long after taking strychnia. I can only suppose that the dose was exceedingly small, but I can see no other cause of death. In this particular case I think the poison was not conveyed through the mother's milk. If it had depended only on the milk, it would have been so rapidly absorbed that in the course of nine hours there would have been no trace.

Cross-examined by Mr. O'Malley: Pure strychnia is a very insoluble substance. It is absolutely necessary that it should be dissolved in the stomach. The liquids of the stomach exercise a solvent power on it very slowly.

In his speech for the prisoner Mr. O'Malley contended that there was no proof that the prisoner had administered poison to her child wilfully or feloniously, and that no reliance could be placed on the statements made by her to Dr. Lowe or Dr. Archer, to the effect that she had poisoned herself and her husband, as she was not conscious all the time of what she was saying and doing, and was unable to reply properly to the questions put by the doctors.

The Jury found the prisoner not guilty. No evidence was offered on the second indictment.

LAW AND POLICE.

MANSLAUGHTER.

On the 18th ult., John Henry Dixon Jenkinson, druggist, Duke-street, Leeds, was committed by Mr. John Webster, coroner, to take his trial at the assizes for the manslaughter of a child named Walter Nutton.

OLDHAM AND WAIN *v.* MERRICK.

At the Alfreton County Court, on the 19th ult., Messrs. Oldham and Wain, chemists and druggists, of Alfreton, were nonsuited in an action for payment of £12 14s. 1d., brought against Mr. Josiah Merrick, of Manchester, for goods sold to defendant's deceased son, who had resided near Alfreton.

CARBOLIC ACID.

On the 19th ult., Mr. Herford, the Manchester City coroner, held an inquest on the body of an iron broker named Adam Knowles, who had died from the effects of poison. Deceased's daughter heard her father fall from a chair in the kitchen, and, proceeding to the spot, found him lying on the floor, and a bottle, the contents of which was like tea, and labelled "Poison," near him. Mr. William H. Barlow, who made the *post-mortem* examination, deposed that deceased had been poisoned by partaking of carbolic acid.

BICHLORIDE OF MERCURY AND ARSENIC.

On the 3rd inst., an inquiry was held at Wisbeach concerning the death of a young man named William Charles Wingfield Robinson, who had committed suicide. The deceased was articled to Messrs. English Brothers to learn the business of a timber merchant, and resided with a surgeon named Maynard. On the 31st ult. he left business, having previously arranged some work to be performed on the following Monday, and went home, retiring to rest. About five minutes after he had been in his bed-room, Mr. Maynard heard him coughing as though he were choking, and on going to his room it was found that he had taken a quantity of a preparation of bichloride of mercury and arsenic which he used for preserving skins. He died from the effects of the poison the following morning.

"COOPER'S SHEEP DIPPING POWDER."

At the Church Stretton Police Court, on the 3rd inst., Mr. Lester, grocer, appeared to a summons charging that he, contrary to law, sold to one George Evans a packet of sheep powder, called "Cooper's Sheep Dipping Powder," containing 8 ounces of arsenic; that he sold the same without entering the fact of the sale in a book, and that he infringed the Act in selling it to the said George Evans, he (Evans) being of immature age. The complainant was Mr. Phillips, chemist, of Church Stretton, who said an Act was passed in 1868 to prevent unqualified persons selling poisons. Defendant was not a qualified person, and the powder sold by him he (Mr. Phillips) had analysed, and found to contain twenty-four parts of sulphur and arsenic, and four parts of soda and other impurities. Mr. Cooper (nephew of the proprietor of the powder) said he was a member of the Veterinary College, and made up "Cooper's Sheep Dipping Powder," which had been regularly sold for upwards of twenty years, and was at present sold, and was in great repute in all parts of England and in most places in Europe. No attempt had previously been made to stop the sale of it. If the case were decided against the defendant, he (Mr. Cooper) would carry it to a superior Court. The magistrate considered that the case was of too important a nature to be adjudicated upon hastily.

THE RECENT PENALTY ON A CHEMIST AND DRUGGIST UNDER THE PETROLEUM ACT.

A few weeks back, Mr. John Corbett, chemist and druggist, of Darlaston, was fined £20 by Mr. Spooner for offences under the Petroleum Act. A fortnight afterwards, Mr. Sheldon, solicitor, presented a petition from some of the inhabitants of Darlaston, praying the stipendiary, if possible, to alter the penalty in the case, as defendant had acted in ignorance of the law, and had always provided every means for the safe storage of the inflammable articles in which he dealt. Mr. Spooner, in reply to this application, said he would take an opportunity of seeing the place, and would consider the petition. On the 10th inst., the following was read by Mr. Ward, in the absence of the worthy stipendiary:—Mr. Corbett, who is a chemist and druggist, residing at Darlaston, was charged before me with two separate offences against the Petroleum Act—Firstly. With storing within fifty yards of a dwelling-house, without a license, thirty-one gallons of naphtha, giving off inflammable vapour at a temperature less than 100° Fah., for which he was liable to a penalty of £20 a day for every day it was so stored. Secondly. For selling naphtha without a label describing its inflammable nature, for which he was liable to a penalty of £5. Mr. Corbett pleaded guilty to the first charge, and I fined him £20, the penalty for one day only. The second charge was allowed to be settled by Mr. Corbett paying costs. Since my decision, I have received a memorial, signed by a number of inhabitants of Darlaston, asking me to remit the penalty of £20, on the ground that Mr. Corbett had stored naphtha for many years, and was ignorant of the law. I have, therefore, carefully reconsidered the case, and I regret to say, in answer to the memorialists, that I remain of opinion that Mr. Corbett *was* not and *could* not be ignorant of the law, but that he wilfully and culpably neglected to obey the provisions of the Petroleum Act, which was passed expressly for the protection of life and property from explosions or fire from naphtha and other dangerous substances, because it was clearly proved before me that the inspector visited Mr. Corbett at his shop in Darlaston in the month of April, and called his attention to the Petroleum Act, and to the necessity of taking out a license for storing naphtha. The proceedings against Mr. Corbett were taken in July following, for an offence in that month. I have also visited the premises of Mr. Corbett, and I find that the store is distant about forty yards from his own dwelling-house, but that it is within five yards of three dwelling-houses built parallel to it, the offices of which houses are only separated from the store by a wall, and that near to these three houses, in nearly a continuous line, there is a factory in which work-people are daily employed, and I think the place very unfit and dangerous for storing naphtha. I must, therefore, firmly refuse to reduce the penalty, and I wish to add that if I had visited the store before I gave my decision, I should, probably, have imposed a higher penalty than I did.

ACCIDENTS.

EXPLOSIVE LUGGAGE.

Early on Monday morning last, the inmates of the George Hotel, Bangor, were alarmed by cries of "Fire!" and on search being made, it was discovered that the flooring of an upper room was burning, and volumes of sulphureous vapour were pervading the upper part of the house. By dint of great exertion, the fire was extinguished, and on inquiring, it was found that it had been caused by the explosion of some material contained in a box belonging to the gentleman who, with his son, occupied the room. On Tuesday, the gentleman, Mr. George John Blake, of London, was charged before the Bangor magistrates with having, in an unlicensed place, an explosive substance. Mr. Blake virtually admitted the offence, though he suggested that the substance was not an explosive, inasmuch as it would only explode by the introduction into it of a strong detonating tube. The magistrates convicted him in a fine of £1 and costs. In the course of the case Mr. Blake explained that the substance was a patented invention of his son's for blasting purposes, and that an experiment had been made by it on the previous Saturday, by which 3lb. of it dislodged a mass of slate and stones weighing from one to two tons. He is at an entire loss to account for its ignition, but believes it to have been occasioned by spontaneous combustion.

GOSSIP.

The annual excursion of the *employés* connected with the establishment of Messrs. Burgoyne, Burbidges, and Squire, Coleman-street, took place on July 17th. The party went by an early train to Box Hill, and after ruralising in that pleasant locality until two o'clock, sat down to an excellent dinner provided at the "Three Tuns," Dorking. The chair was occupied by F. Burbidge, Esq., and the efficient manner in which he discharged the duties tended very much to enhance the pleasure of the day. The usual loyal and patriotic toasts were drunk, and a number of songs suitable to the occasion were sung, making up a most pleasant day's entertainment.

Mr. Payne lately held an inquest respecting the death of John Greanes, aged fifteen. The deceased was employed as errand boy at Messrs. Burgoyne's, wholesale druggists, of Coleman-street, and while seated in a truck outside his employer's shop, a piece of wood knocked against his pocket and an explosion at once occurred. His clothes were set on ire, and he was so badly burnt that he died a few days fterwards. The lad had been in the habit of playing with red fire," and at the time of the explosion there was an unce of it in his pocket. The jury returned a verdict of Accidental death" by fire.

TRADE MEMORANDA.

R. J. H. Walls, of the firm of Walls, Close, and Co., 42a, annon-street, is now carrying on business at 101, London-all, where he continues the manufacture of many of the ecialities of the late firm.

GAZETTE.

BANKRUPTS.

Badge, G. N., Cardiff, Doctor of medicine.
Bagshawe, E. L., Bath, surgeon.
Head, Thomas, Skelton, doctor.
Herbert, H. C. Joce, Blandford, Dorset, chemist.
Hilder, N. A., New-terrace, Camberwell-park, surgeon.
Howkins, Thomas, Birmingham, surgeon dentist.
Long, William, Kidderminster, chemist.
Parkinson, R. B., Kendal, Westmoreland, veterinary surgeon.
Pinder, David, High-street, Southwark, coffee importer.
Shew, J. F., Newman-street, Oxford-street, London, photographic dealer.
Vavasour, Horace, Colsterworth, surgeon.
Vine, William, Hartland, Devon, surgeon.
Westmacott, J. M., Alcester, chemist.

PARTNERSHIPS DISSOLVED.

Coates and Blackmore, Salisbury, surgeons.
Taylor and Taylor, Nottingham, veterinary surgeons.

PATENTS

[The following list has been compiled expressly for the Chemist and Druggist by L. de Fontainemoreau, Patent Agent, 4, South-street, Finsbury, London; 10, Rue de la Fidélité, Paris; and 33, Rue des Minimes, Brussels.]

Provisional Protection for six months has been granted for the following:—

No.

1790. G. Fry, of Ethelburga House, Bishopsgate-street Within, Timber Merchant. Improvements in the treatment of wood for obtaining fibre for the manufacture of paper and cordage; also for the production of acid, spirit, ether, resin, and other substances, or liquids from wood, and in machinery or apparatus therefor. Dated 10th June, 1869.

1893. M. Olsson, of 69, Richmond-road, Barnsbury. Improvements in preserving animal and vegetable substances. Dated 21st June, 1869.

1936. H. Caro, of Mannheim, Grand Duchy of Baden, and C. Graebe, and C. Liebermann, both of Berlin, Chemists. Improvements in preparing colouring matters. Dated 25th June, 1869.

1938. A. B. Childs, of 16, Mark-lane. Improvements in catamenial sacks or uterine supports. Dated 25th June, 1869.

1957. W. R. Lake, of Southampton-buildings, Chancery-lane. An improved method of, and apparatus for, rendering and refining lard, tallow, and other fatty and oleaginous matter. Dated 28th June, 1869.

1970. W. E. Gedge, of Wellington-street, Strand. The incorporation of extract of meat with all kinds of sweetmeats or comfits, with syrups or any sweet or glucose matter, with quinine wine and all kinds of wines prepared with quinquina. Dated 20th June, 1869.

1976. J. Robinson, of Martin's-lane, Solicitor. Improvements in means or apparatus for preserving animal and vegetable substances. Dated 30th June, 1869.

1990. H. Larkin, of 6, Torriano-cottages, Leighton-road, and W. White, of 30, Thurlow-road, Hampstead. Improvements in the production of sodium and potassium. Dated 1st July, 1869.

1999. C. D. Abel, of Southampton-buildings, Chancery-lane. Improvements in the mode of and materials for preparing corks for rendering them impermeable under the action of wines and other liquids, either when charged with gases or not. Dated 2nd July, 1869.

2003. J. Smithers, of 12, Dawson-street, Dublin. Improvements in galvanic batteries. Dated 2nd July, 1869.

2006. H. E. Newton, of Chancery-lane. Improvements in meters for measuring liquids. Dated 2nd July, 1869.

2012. A. H. A. Durant, of 3, Avenue-road, Shepherd's Bush. Improvements in the mode or means of preparing or treating castor and other oleaginous seeds or berries for the manufacture of oil, and in the manufacture of oil from the seeds or berries so prepared or treated. Dated 3rd July, 1869.

2028. G. Buchanan, of 14, Surrey-street, Strand, Merchant. Improvements in preserving animal and vegetable substances for use as food, and in apparatus for effecting the same. Dated 6th July, 1869.

2038. W. Q. East, of the Drummond Hotel, Drummond-street, Euston-square. Improvements in the means of, and apparatus for indicating or registering the flow of liquids or fluids from vats, casks, or other receptacles. Dated 6th July, 1869.

2041. D. Cope, of Liverpool, Oil Merchant. Improvements in apparatus to prevent waste of liquids in filling casks. Dated 7th July, 1869.

2046. A. P. Price, of Lincoln's-inn-fields, Consulting Chemist. Improvements in producing partial or complete anæsthesia. Dated 7th July, 1869.

2054. J. H. Johnson, of Lincoln's-inn-fields. Improvements in the preparation of meat for preservation and in the preservation of the same. Dated 7th July, 1869.

2062. J. L. Pulvermacher, of Regent-street, Electrical Engineer. Improvements in the construction of chains, battery, and apparatus for producing electric currents, also in means of applying the same for medical and other purposes. Dated 8th July, 1869.

2077. J. Gessert, of Manchester, Manufacturing Chemist. Improvements in the recovery of nitric acid and in apparatus connected therewith. Dated 10th July, 1869.

2092. J. Dewar, Doctor of Medicine, of Kirkcaldy, Fife, North Britain. Improvements in treating certain substances for food and for manure. Dated 12th July, 1869.

2101. J. H. Player, of Birmingham, Manufacturer. Improvements in utilising the residual sulphate of lime produced in the manufacture of phosphorus. Dated 12th July, 1869.

2102. W. R. Lake, of Southampton-buildings, Chancery-lane. Improvements in the manufacture of white lead. Dated 12th July, 1869.

2116. J. Baggs, of High Holborn. Improvements in the generation and treatment of ammonia. Dated 14th July, 1869.

Letters Patent have been issued for the following:—

26. W. Prosser, of Lancaster, Lecturer on Chemistry. Improvements in the purification and bleaching of oils, gums, and resins and spirits. Dated 5th January, 1869.

30. J. Balbirnie, of Fernley-place, Sheffield, Physician. A new and improved apparatus for inhaling vapours, medicated air, or gases. Dated 5th January, 1869.

42. K. Walter, of Wicklow. Improvements in the manufacture of sulphuric acid. Dated 6th January, 1869.

117. T. Cook, of Old Kent-road, and J. Watson, of Victoria Chambers, Westminster, Engineers. Improvements in presses for expressing oils and other liquids. Dated 14th January, 1869.

130. P. Spence, of Newton-heath, Manchester, Manufacturing Chemist. Improvements in the production of sulphate of potash for the manufacture of alum. Dated 15th January, 1869.

148. F. Braby, of Camberwell. Improvements in the manufacture of sulphate of ammonia. Dated 16th January, 1869.

262. A. C. Pass, of the Bedminster Smelting Works, Gloucestershire, Smelter. Improvements in the method of and apparatus for condensing and purifying metallic and other fumes, vapours, gases, and smoke, and obtaining oxide of zinc. Dated 27th January, 1869.

270. R. Blackbee, of Norfolk-road, Dalston. An improved pessary. Dated 29th January, 1869.

315. D. Joy, of Saltburn, York, Engineer. Improvements in means and apparatus for extracting oils and other liquids from the substances in which they are contained. Dated 2nd February, 1869.

317. A. E. Harris, of 136, Mile End-road, Dentist. An improved method of making plates or palates for artificial teeth. Dated 2nd February, 1869.

318. W. J. Palmer and W. P. Goulding, Surveyors, both of Reading. Improvements in evaporating and calcining alkaline solutions which have been used to boil vegetable fibres. Dated 2nd February, 1869.

319. W. A. Smith, of Manchester, Merchant. Improvements in the preservation of meat, fish, and other perishable articles of food, during their carriage by railway, and in apparatus connected therewith. Dated 2nd February, 1869.

329. A. S. and A. R. Stocker, both of Lamb's Conduit Works, Artillery-street, Horselydown, Glass Manufacturers. Improvements in caps or stoppers applicable to, and the employment of them with feeding and other bottles. Dated 3rd February, 1869.

376. E. Meldrum, of Dechmont, Linlithgow, North Britain. Improvements in the manufacture of paraffin oil. Dated 6th February, 1869.

419. P. Taysen, of Leith, Scotland. Improvements in the manufacture of stearic and oleic acids. Dated 10th February, 1869.

637. J. Townsend, Manufacturing Chemist, and P. Forbes, Analytical Chemist, both of Glasgow. Improvements in refining or purifying oils and fats. Dated 2nd March, 1869.

727. G. Spencer, of 77, Cannon-street, Civil Engineer, and J. Barker, of Saint Leonard's, Mortlake, Merchant. Improvements in preserving animal substances, fruits, and other substances made from corn, grain, or other vegetable matter. Dated 9th March, 1869.

847. J. Hamilton and R. Paterson, both of Glasgow. Improvements in apparatus for containing, treating, preserving, cooling, withdrawing and conveying fermentable and aërated beverages. Dated 20th March, 1869.

1214. M. Andrew, of Southampton-buildings, Chancery-lane. Improvements in vessels for containing oil or other liquids, and in devices for drawing the contents from the same. Dated 20th April, 1869.

1260. J. Major, Veterinary Surgeon, and W. Wright, both of Swallow-street, and G. H. Jones, of the Alpha-road. A new or improved manufacture of white lead, and apparatus employed therein. Dated 24th April, 1869.

1469. J. Townsend, Manufacturing Chemist, and P. Forbes, Analytical Chemist, both of Glasgow. Improvements in refining or treating oils and fats, and in apparatus therefor. Dated 13th May, 1869.

1568. G. Johnston, of San Francisco, California. Improvements in the distillation of spirituous liquors, and and in apparatus to be employed therefor. Dated 20th May, 1869.

Patents which have become void:—

1884. E. Hunt and H. D. Pochin, both of Salford, Lancaster, Chemists. An improved condensing apparatus. Dated 27th June, 1862.

1891. A. C. Croll, of Coleman-street, Engineer. Improvements in the treatment of ammoniacal liquor of gas-works. Dated 27th June, 1862.

1973. A. Gilbey, of Oxford-street, Wine Merchant. Improvements in apparatus for washing and cleansing bottles. Dated 9th July, 1862.

2044. J. Dickson, of 66, Tollington-road, Holloway. Improvements in the manufacture of caustic soda and carbonate of soda. Dated 17th July, 1862.

1662. T. Godfrey, of 17, Hanover-street, Hanover-square. Improvements in artificial teeth. Dated 22nd June, 1866.
1692. W. E. Newton, of Chancery-lane. An improved spirit meter. Dated 25th June, 1866.
1703. W. R. Lake, of Southampton-buildings, Chancery-lane. Improvements in the manufacture of white lead. Dated 26th June, 1866.
1763. G. R. Sheraton, of Sedgefield, Durham. A new or improved instrument to be used in cases of difficult parturition. Dated 3rd July, 1866.

Specifications published during the month:—

1868. Postage 1d. extra.
3359. B. Hunt. Electro-physiological battery for the human body. 8d.
3504. F. O. Ward, W. Ibbotson, and A. G. Southby. Recovering alkali from solutions used in manufacturing paper. 1s. 8d.
3506. A. McDougall. Manufacture of phosphatic manures and sulphate of ammonia. 4d.
3514. W. Thompson. Cases for packing bottles and jars. 6d.
3515. C. D. Abel. Manufacture of phosphorus and amorphous phosphorus. 6d.
3516. H. Carrigg. Manufacturing and applying tribasic phosphate of lime. 4d.
3527. A. Leykauf. Colouring matter. 4d.
3557. J. Sturrock. Caps for bottles. 4d.
3583. P. Spencer. Indigo blue. 4d.
3624. E. S. Samuell. Manufacture of superphosphate of lime. 4d.
3652. H. A. Bonneville. Mineral teeth. 4d.
3653. W. Betts. Capsules for bottles, &c. 10d.
3655. J. B. Shillcock. Securing the contents of bottles, jars, &c. 4d.
3691. J. H. Johnson. Apparatus for treating diseases. 1s.
3822. W. A. Vérel and J. Cameron. Precipitating copper, &c. 4d.
3846. J. C. Walker. Baking powder. 4d.
3859. C. Liebermann and C. Graebe. Colouring matters. 4d.
3863. E. P. H. Vaughan. Manufacture of resin oil. 4d.
3870. P. Spence. Manufacture of alum, &c. 4d.

Correspondence

THE NEW RELATIONS OF THE COUNCIL.

TO THE EDITOR OF THE CHEMIST AND DRUGGIST.

Sir,—I have just received my *Pharmaceutical Journal*, and the sight of the report of Council proceedings brings to my mind that I had promised myself the pleasure of writing a few lines to you on the subject of your leader of last month. I was very glad to see you doing your duty as an editor in giving us as much information as you could regarding the mysterious distillations of the great alembic at Bloomsbury; and I hope you will continue your services in that respect, for to many of us, uninitiated in the art of reporting, the appearance of those two pages of calx have but an occult meaning. It requires the touch of your magic rod to extract something beautiful and readable, if not poetical, out of this dull matter. Is this what Mr. Ince calls précis? If so, I would rather see the calx in combination with its ethereal quintessence, so that we may have the more lively and attractive being as the offspring of the resolution at the annual meeting, instead of this dead letter. I cannot help thinking that Mr. Ince must have been at the bottom of that mode of reporting proceedings, he is so fond of the dead languages. But you have shown that beautiful truths will rise, phœnix-like, out of the ashes of our sires. By the way, there surely was one truth which you did not extract from this report. But then, perhaps, it was an ugly one, and you have such an eye for the beautiful, of course you could not see it. I will not say what it is, but only ask you the question, Is not Mr. Morson the editor's father-in-law? And when their family interests throw weight on one side of the balance, is it not usual and right for the interested parties to abstain from voting? By the present month's journal I see they have refused admittance to your reporter. They evidently prefer darkness to light, and though it is not now absolute darkness, it is the ghostly dimness of their prison house which suggests an unearthly voice declaring, "I could a tale unfold!"

I see Mr. Ince is a prime mover for this darkness. I was at first surprised, but I remember he inherits a business which dates back to the days of alchemy. But are Brady and Carteighe the only two men not afraid of daylight and ventilation? I sometimes think the Council look down upon the country members as being almost unworthy of their consideration, like fools and children we are not to be trusted with the sights of half-finished work; but repeated experience has shown that if half-finished work were fully discussed by those most interested in it, practical points would often be attended to before it was too late, and we would be saved the necessity of a second bill to amend the first.

Another point in this month's report is the question, Is an M.P.S. by examination competent to conduct the preliminary examination? And the voting shows in what degree of respect the examinations are held by the voters. This is a case of dead language; and now we have Mr. Ince on the right side:—he believes in dead languages and their virtues in the healing art. He knows he would put a student through a fine sieve, as indeed I trust would most of those who voted with him. It would be a far better practical examination than a lad would get at the hands of most graduates of Universities. Those who voted against it were Deane, Evans, Haselden, Morson, Sandford, and Williams. Was it a vote of want of confidence in their own classics? If so, I can sympathise with them. The most of us trouble ourselves very little about classics after we get into business, and might find it awkward to have to examine a boy fresh from school. I know I should not like the task.

The last point I will raise, and which, from the absence of your reporter, you will probably not be able to answer, is the note that the lectures on Chemistry and Pharmacy are in future "to be fully illustrated by experiments and practical demonstration." To whom are we indebted for the valuable addition to the instruction imparted in the lecture room at Bloomsbury Square? Did anybody move and second it? Was it moved by Mr. Morson and seconded by Mr. Ince? But who voted against it? That is the question that would tell upon the voting for next Council.

Your Country Cousin.

TO THE EDITOR OF THE CHEMIST AND DRUGGIST.

Sir,—With your permission, I desire to make a few observations on the refusal of the Pharmaceutical Council to permit a full report to be made of their proceedings for the benefit of the trade. I presume this decision—though very unexpected, from the tenor of the last annual meeting—is to be considered as clear evidence that the present members of the Council are not prepared, and are even opposed to have their proceedings reported in a free and open manner. This exclusive policy may have been in a manner defensible when the members of our Society were few, as before the passing of the Pharmacy Acts; now, however, those interested comprise the whole of the chemists and druggists of England and Scotland. It is strange, therefore, when this altered condition has come about, that our representatives should deny to us the undoubted right of knowing the reasons that may have been adduced by them, fallacious or full of wisdom as they may have happened to have been, for voting either for or against any motion affecting our interest. How are we to know the capacity vouchsafed to the members of the Council, unless their discussions, as well as their votes, are reported for our consideration? How, also, is it possible to fairly discover the most able men on the Board, or to discover those who misrepresent us there, if the proceedings are only partially reported by their own accredited organ? It is to be hoped that a more rational as well as a wiser spirit will guide the decision of the Council when next the question is brought before them, and that before long we shall be duly made acquainted with all their proceedings.

I would not have troubled you or your readers with this letter, had I not felt the importance of giving expression to opinions held by many more members of the trade than the Council are aware of.

I am, Sir, yours obediently,
Robert Hampson,
Pharmaceutical Chemist.
63, Piccadilly, Manchester, August 9th.

STRYCHNIA FOR MORPHIA.

TO THE EDITOR OF THE CHEMIST AND DRUGGIST.

Dear Sir,—A report of a fatal case of poisoning at St. David's, by the original substitution of strychnia for morphia in a bottle received from "a wholesale druggist in Bristol" (not named), having been widely circulated, we shall feel obliged by your mentioning in your journal that our firm is not in any way connected with the painful occurrence.

Yours truly,
A. & J. Warren.

24, Redcliff-street, Bristol,
August 3rd, 1869.

TO THE EDITOR OF THE CHEMIST AND DRUGGIST.

Sir,—With reference to the published report of a case of poisoning by strychnine at St. David's, we think it is imperative upon us to state that we are *not* "the wholesale house in Bristol" who supplied strychnia in mistake for morphia. We invariably send out strychnine for dispensing purposes in *crystals*. Your insertion of this note in your next will oblige, Sir,

Yours faithfully,
Ferris and Company.

4 and 5, Union-street, Bristol,
August 3rd, 1869.

Varia.

CHANCES OF DEATH BY DIFFERENT DISEASES.

Taking the English population in the aggregate the chance that among the various forms of death the fate which a human being must encounter will be accidental or from injury inflicted, is nearly as 1 to 29. The chance that death will be by zymotic disease is as 1 to 6; and the chance that it will be by consumption is nearly as 1 to 9; but, of course, the risk is increased to some, and, therefore, lessened to others, according to occupation, sex, age, and other circumstances. The following results, showing the proportional number of deaths in England in 1867 from each cause to 1,000,000 deaths from all causes, arranged in the order of their fatality, will enable the chances of death by different diseases to be determined in the above manner:—From consumption, 118,003; bronchitis, 86,554; atrophy and debility, 69,284; old age, 61,414; convulsions, 56,294; heart disease, 46,499; pneumonia, 45,275; diarrhœa, 42,559;; typhus, 36,150; scarlatina, 26,370; whooping-cough, 25,454 paralysis, 23,175; apoplexy, 22,309; premature birth, 19,272; cancer, 18,320; dropsy, 15,211; hydrocephalus, 15,095; tabes meseuterica, 14,754; fracture and contusions (accident), 14,141; measles, 14,124; brain disease, 12,158; liver disease, 11,859; lung disease, 10,278; croup, 9,405; teeth, 9,129; cephalitis, 9,047; asthma, 8,035; sudden death, cause unascertained, 7,516; stomach disease, 6,320; scrofula, 6,299; kidney disease, 6,260; enteritis, 6,127; drowning (accident), 5,737; burns and scalds (accident), 5,520; diphtheria, 5,574; smallpox, 5,388; childbirth, 5,029; epilepsy, 4,957; rheumatism, 4,837; nephria, 4,723; syphilis, 3,641; joint disease, 3,584; peritonitis, 3,368; jaundice, 3,201; erysipelas, 3,129; want of breast milk, 3,080; suffocation (accident), 2,899; mortification, 2,849; hepatitis, 2,828; laryngitis, 2,755; ileus, 2,528; thrush, 2,493; accident not specified, 2,393; uterus disease, 2,291; metria, 2,285; dysentery, 2,062; ulceration of intestines, 1,990; hernia, 1,987; cholera, 1,977; pleurisy, 1,854; gastritis, 1,591; ascites, 1,552; diabetes, 1,458; insanity, 1,372; influenza, 1,301; pericarditis, 1,269; malformations, 1,081; aneurism, 1,078; hanging (suicide), 1,046; cyanosis, 1,031; purpura and scurvy, 1,010; ulcer, 950; nephritis, 948; phlegmon, 922; murder and manslaughter, 840; spina bifida, 832; cystitis, 817; gout, 808; intemperance, 802; delirium tremens, 791; skin, 776 violent deaths not specified, 641; introsusception, 635; poison (accident), 602; stricture of intestines, 596; cut or stab (suicide), 575; ovarian dropsy, 530; carbuncle, 504; drowning (suicide), 489; stone, 431; quinsy, 431; stricture of urethra, 422; noma, 373; worms, 369; suicide, means not stated, 300; poison (suicide), 289; gunshot (accident), 266; ague, 259; pavamenia, 247; privation, 234; ischuria, 227; zymotic diseases not specified, 225; cut or stab (accident), 221; fistula, 214; spleen, 199; remittent fever, 184; arthritis, 161; gunshot (suicide), 122; chorea, 107; pancreas disease, 39; hanging (execution), 24; hydrophobia, 21; glanders, 9. Out of every 1,000 deaths 195 were caused by zymotic diseases, 192 by constitutional diseases, 402 by local diseases, 167 by developmental diseases, and 36 by accidental and other violence.

TRADE REPORT.

The promise of an abundant harvest, which, according to most of the agricultural authorities, seems again so likely to be realized, is certainly at this time the subject which is most worthy of congratulation with all classes of commercial men. On the results of the bucolic labours of the next few weeks depends to a very large extent the success of business enterprise during the forthcoming year; and hoping, as we do, that we may be able to record month by month continued and increasing activity in the legitimate branches of trade which we report, we regard the harvest month with especial interest and anxiety.

The trade of the country has been steadily improving throughout the year, and although implicit reliance cannot be placed on the Board of Trade Returns, which we have frequently quoted in this column, until these have been made up and corrected for the year, their general tone has constantly been of such a character as to afford good reason to believe in the favourable tendency of commercial transactions. Not the least promising sign of the times is the wholesome dread which most honest men now have of mere speculation, and the equally wholesome confidence which they repose in steadier but safer enterprise. We trust the severe lesson of the past few years will preserve this generation at least from any recurrence of such a crisis as that from which we are now but slowly recovering.

The results of business in Mincing-lane during the month have been generally satisfactory to sellers. The following reports indicate a fair general demand, although prices have not materially altered:—

CHEMICALS.

Acids: Tartaric more doing; sales of foreign at 1s. 2d., and English 1s. 2½d. per lb. Citric quiet at 2s. 6½d., and Oxalic at 7½d. per lb. Soda Ash little inquired for at 1⅜d. to 2⅛d. per degree, and sales of Caustic at 13s. 3d. to 14s. for 60 per cent., and 17s. 6d. for 70 per cent. Soda Crystals continue dull at £4 5s., and Bicarbonate at £9 10s. per ton. Saltcake held for £3 per ton. Phosphate dull at 33s. 6d. Refined Borax more inquired for, 67s. 6d. per cwt. having been paid for several tons. Potash firmer, 11½d. required for yellow Prussiate, and 1s. 10d. per lb. for red. Chlorate dull at 11½d. per lb. Bichrome is scarce at 5d. per lb. Muriate quiet at £8 10s., and sales of refined Saltpetre at 28s. per cwt. Alum in fair demand, at £7 per ton for lump, £7 15s. for powdered, and £8 10s. for ground. Sal Ammoniac: Sales made at 36s. for seconds, which is very scarce, and 38s. per cwt. for firsts. Sulphate of Soda held for 15s. 9d. to 16s., and Carbonate at 5¾d. per lb. Sulphur: Sales at £9 10s. to £9 15s. for roll, and £12 10s. per ton for flour. Bleaching Powder: Little doing at 8s. to 8s. 6d. per cwt., and brown Acetate at 13s. per cwt. Magnesia uninquired for; carbonate 42s. 6d. per cwt., calcined 1s. 6d. per lb. Arsenic: Sales at £7 to £7 5s. per ton. Phosphorus: No change; 1s. 8½d. for wedges, and 1s. 10d. per lb. for sticks. Copperas continues in demand at 50s. to 52s. 6d. per cwt. Copper: Sales of sulphate at 22s. 6d. to 23s. per cwt. Verdigris quiet at

12d. per lb. Lead: White sugar realizes 39s. to 39s. 6d., and brown 28s. per cwt. Nitrate nominal at 32s. per cwt. Bleaching Powder has been rather pressed on the market, and the price has, therefore, still further receded. Sulphate of Quinine (French) is somewhat firmer. The quotations for Refined Saltpetre are nominal, sales having been made at lower prices.

DRUGS.

Cape Aloes are in moderate demand, and bring rather advanced prices. Socotrine, unless very superior, is almost unsaleable, the stock being large. Camphor, although nominally at the same price, is but little inquired for, and we look for a decline. The stock is nearly double that of this time last year, viz., 4,984 packages against 2,528 packages. Castor Oil is dull and declining. Almond Oil is also lower. American Oil of Peppermint is cheaper. There has been a steady demand for Cardamoms, and Cinnamon has also sold well. Fine qualities of Tinnevelly Senna and best East Indian Rhubarb are much wanted. Sandal Wood and Oil of Sandal Wood are scarce and dearer. Turkey Opium is from 3s. to 4s. dearer this month for similar qualities. Saffron is advancing. Gums: Arabic; large supplies sold at easy rates. Australian no demand. Copal and Myrrh held firmly. Olibanum very high. Considerable activity in Shellac, prices having advanced from 5s. to 7s. per cwt. Large business has been transacted by private contract. D. C. Orange has sold at as high a figure as 95s., and other marks in proportion. Nutmegs and Mace are firm, and have been largely sold privately. Isinglass of all kinds brings advanced prices. Foreign Bees' Wax from India and the Cape have sold freely for clean yellow. Japan Wax is largely held, and is scarcely so firm as it has been hitherto.

OILS.

Linseed has moved off slowly, and £31 has been accepted on the spot here, but the market closes a degree firmer, there being buyers thereat. Rape Oil, which offered early in the week at £38 10s. for English brown on the spot, has since become firmer, and is not now obtainable under £39; for September-December, the latter price was taken at one period, but £40 was subsequently paid, and is still demanded. Refined is worth £41, and foreign £42 to £42 10s., brown £39 10s. A good business has been done in Cotton Oil, of which there are buyers at £36 for refined on the spot, and sales have been effected at £36 10s. to £37 for the last four months. The market for Olive has been active, and prices have had an upward tendency. Mogador has been sold at £51, and 10 tuns at £50 10s. Seville is now quoted £53 10s., and Malaga £54. Several cargoes shipping and afloat have been sold during the week—a Mitylene cargo at £52, delivered in Liverpool; two Smyrna cargoes, respectively at £49 5s. and £49 10s. c f and i, to the United Kingdom; and a cargo of Tarranto off the coast at £51 15s. c f and i, U. K. A cargo of Gioja has been landed for higher prices, and a cargo of Tunis quoted £52. 10 pipes eating bought in at 5s. Cocoanut has met a moderate demand at £41 to £42 for Ceylon, although a sale of 25 tons has been made at a price equal to £40 5s. cash, while Cochin has ruled at £43 10s. to £44 10s. for fair to fine. Of 130 casks Cochin offered by auction, 72 casks fair to good sold at £43 10s.; 34 casks Ceylon were bought in at £41 10s. Palm has been firm, at £41 10s. to £42 for fine Lagos. 140 casks fine Lagos were bought in at £42; 289 casks Coast Oil sold, ordinary to fair £37 10s. to £40, and 25 casks brown Palm-nut Kernel at £38. The demand for Sperm continues inactive, with sellers of American at £90, and of Colonial at £92; Pale Seal £39, pale Southern £37. Cod is dull, with sellers at £44 10s. to £45.

PETROLEUM.

The market has been rather firmer; 1s. 7d. has been paid for S. W. refined on the spot, and 1s. 7½d. to 1s. 8d. for fine to superior. October to December sold at 1s. 7½d., and 1s. 7¾d. was paid for November-December; only August shipment sold at 1s. 7d. delivered at this port, and August-September at 1s. 6¾d. to 1s. 6½d. Our stock of refined is 23,056 barrels and 18,138 cases, and the deliveries last week were 1,302 barrels against 32,400 and 320 barrels respectively the corresponding week last year. Of 100 barrels Spirit offered by auction, a part sold at 10d.

DRYSALTERIES.

The latest reports from Calcutta are still more unfavourable than hitherto respecting the prospects of the Indigo crop in Bengal. As a consequence, holders are very firm, and large quantities have been sold at advanced prices. The finer qualities are chiefly in demand. The auctions for Cochineal on the 28th ult. passed off with but little spirit, and a decline of from 1d. to 2d. per lb. was the general result. Safflower sells readily. Galls declining. Logwood and Fustic are firm. Red Sanders is higher. Camwood has not been bought. Other drysalteries remain at previous rates.

Monthly Statement

Of the Stocks, Landings, and Deliveries of the following Goods at the Port of London, from Jan. 1 to July 31, 1869 and 1868:—

		Stock July 31.		Landings.		Deliveries.	
		1869	1868.	1869.	1868.	1869.	1868.
Aloes	cases	2525	2400	1398	1367	1675	2187
	kegs	106	79	28	—	—	33
	gourds	699	717	184	—	463	1036
Aniseed, Star	chests	480	612	255	450	241	172
Arrowroot	casks	14102	16081	6388	8354	5374	5009
	boxes and tins	18180	22241	6865	11010	7329	7877
Balsam	casks, &c.	180	381	573	544	920	412
Bark, Medicinal,	casks and cases	357	292	256	119	131	132
	serons, &c.	5205	7354	10232	11654	11514	13065
Bark, Tanners	tons	—	—	—	—	—	—
Borax	packages	178	83	193	2	148	10
Bees & veget. wax	bales & serons	712	241	607	237	369	243
	casks and cases	2815	709	4188	881	2166	1577
	cakes	1226	335	1504	2200	1421	3442
Brimstone	tons	—	—	—	—	—	—
Camphor	packages	4084	2258	10030	2740	9267	2287
Cardamoms	chests	232	201	464	331	323	220
Cochineal—							
Honduras	serons	1458	1996	1076	821	2327	2240
Mexican	,,	508	723	665	941	441	918
Teneriffe	,,	4903	4535	10397	10318	12495	10878
Coculus Indicus	bags, &c.	1440	916	251	62	387	136
Colombo root	packages	1935	1860	262	89	167	561
Cream of Tartar	casks	18	111	61	155	61	282
Cubebs	bags	1632	1673	—	504	553	115
Dragonsblood	chests	220	87	102	89	48	99
Galls E. I.	casks and cases	3958	2105	4627	4884	5523	4773
Mediterranean	sacks	5	15	18	31	28	86
Gum—							
Ammoniac	packages	188	199	10	35	25	23
Animi and Copal	,,	1728	1251	5826	2196	5747	2404
Arabic, Barbary	,,	64	74	127	264	226	350
Turkey	,,	77	84	8	55	12	55
East India	,,	3050	1996	3197	4205	2297	3235
Assafœtida	,,	35	93	64	174	100	176
Benjamin	,,	1552	866	1292	768	981	778
Dammar	,,	1131	929	1247	213	1289	404
Galbanum	,,	8	1	8	6	2	11
Gamboge	,,	159	155	187	345	172	263
Guaiacum	,,	74	93	64	83	65	74
Kino	,,	104	231	11	225	109	93
Kowrie	tons	961	1381	1043	1075	1004	958
Mastic	packages	176	204	4	2	11	31
Myrrh, E. I.	,,	53	51	161	206	156	165
Olibanum	,,	1511	2256	2388	3289	2472	2233
Sandarac	,,	455	149	903	481	536	471
Senegal	tons	78	77	44	43	44	36
Tragacanth	packages	22	28	—	16	—	26
Ipecacuanha	casks and bags	279	149	412	229	207	207
Jalap	bales	268	451	274	417	252	216
Lac Dye	chests	—	—	—	—	—	—
Nux Vomica	packages	3511	413	1811	701	3754	636
Oil—							
Castor	casks	115	89	180	12	173	6
	cases	1465	160	2085	870	1972	1137
	tins	19337	17908	30142	40986	21870	27706
Palm	tuns	1193	850	3258	3686	3600	3488
Cocoanut	,,	5639	3117	8391	5796	6046	5910
Olive	casks, &c.	3858	1159	7326	2558	4182	3074
Aniseed	cases	210	94	476	259	374	262
Cassia	,,	671	442	366	281	448	210
Opium	chests, &c.	59	103	—	—	no	retrn
Rhubarb	chests	1747	1113	1384	1794	1406	1288
Safflower—							
Bengal	bales	901	1095	1072	1599	1974	2189
Bombay	,,	173	83	164	44	173	57
Saffron	packages	1	10	11	2	20	1
Sarsaparilla	bales	465	201	1396	830	1312	965
Senna	bales, &c.	1765	2424	1478	2124	2079	1942
Shellac	chests, &c.	10103	9573	10017	7290	10069	9843
Sticklac	,,	—	—	—	—	—	—
Terra Japonica—							
Gambier	tons	4325	3068	5597	7975	4467	6395
Cutch	,,	903	177	909	911	1530	1158
Turmeric	,,	834	486	1002	317	1104	632
Vermilion	chests, &c.	94	52	80	10	100	38

Monthly Price Current.

The prices quoted in the following list are those actually obtained in Mincing lane for articles sold in bulk. Our Retail Subscribers must not expect to purchase at these market prices, but they may draw from them useful conclusions respecting the prices at which articles are offered by the Wholesale Firms.]

CHEMICALS.	1869. May s.	d.	to	s.	d.	1868. May s.	d.	to	s.	d.
ACIDS—										
Acetic ....per lb.	0	4	..	0	0	0	4	..	0	0
Citric ....per lb.	2	6	..	2	6½	2	7	..	2	8
Nitric .... ,,	0	5	..	0	5½	0	5	..	0	5½
Oxalic .... ,,	0	7½	..	0	8	0	8	..	0	0
Sulphuric ...... ,,	0	0¾	..	0	1	0	0¾	..	0	1
Tartaric crystal .. ,,	1	2½	..	0	0	1	2¼	..	0	0
powdered ,,	1	3	..	0	0	1	3½	..	0	0
Antimony ore......per ton	280	0	..	300	0	280	0	..	0	0
crude ..per cwt	32	0	..	0	0	23	0	..	0	0
regulus.. ,,	52	0	..	0	0	43	0	..	0	0
star .... ,,	50	0	..	51	0	43	0	..	0	0
Arsenic, lump...... ,,	16	0	..	16	6	16	0	..	16	6
powder.... ,,	7	3	..	7	6	7	6	..	8	0
Brimstone, rough ..per ton	165	0	..	0	0	132	6	..	135	0
roll ....per cwt	10	6	..	0	0	10	0	..	10	6
flour.... ,,	13	0	..	13	6	14	0	..	14	6
Iodine, dry ....per oz.	0	9¾	..	0	10	0	9¾	..	0	10
Ivory Black, dry..per cwt.	0	0	..	0	0	0	0	..	0	0
Magnesia, calcined..per lb.	1	6	..	1	8	1	6	..	1	8
Mercury..... .. per bottle	137	0	..	138	0	137	6	..	0	0
Minium, red ......per cwt.	20	9	..	21	0	21	0	..	22	0
orange .... ,,	31	6	..	32	6	33	6	..	0	0
Precipitate, red ....per lb.	2	6	..	0	0	2	6	..	0	0
white .. ,,	2	5	..	0	0	2	5	..	0	0
Prussian Blue ...... ,,	0	0	..	0	0	1	0	..	1	10
SALTS—										
Alum ....per ton	145	0	..	150	0	150	0	..	155	0
powder .... ,,	165	0	..	170	0	170	0	..	175	0
Ammonia:										
Carbonate ......per lb.	0	5¾	..	0	6	0	5	..	0	5¼
Hydrochlorate, crude, white........ per ton	460	0	..	540	0	420	0	..	500	0
British (*see* Sal Ammoniac)										
Sulphate ......per ton	325	0	..	330	0	290	0	..	310	0
Argol, Cape ......per cwt	65	0	..	80	0	65	0	..	75	0
France .... ,,	45	0	..	58	0	45	0	..	60	0
Oporto, red ,,	22	0	..	24	0	25	0	..	27	0
Sicily . .. ,,	32	0	..	40	0	45	0	..	50	0
Naples, white ,,	55	0	..	65	0	60	0	..	65	0
Florence, white	0	0	..	0	0	70	0	..	75	0
,, red ,,	0	0	..	0	0	60	0	..	65	0
Bologna, white ,,	0	0	..	0	0	0	0	..	0	0
Ashes (*see* Potash and Soda)										
Bleaching powd..per cwt.	9	0	..	9	3	11	0	..	11	3
Borax, crude .... ,,	25	0	..	40	0	25	0	..	35	0
(Tincal) .. ,,	45	0	..	60	0	30	0	..	50	0
British refnd. ,,	68	0	..	70	0	2	6	..	55	0
Calomel ....per lb.	2	5	..	0	0	2	5	..	0	0
Copper:										
Sulphate ......per cwt.	23	6	..	24	0	23	6	..	24	0
Copperas, green ..per ton	52	6	..	60	0	55	0	..	60	0
CorrosiveSublimate..p.lb.	1	11	..	0	0	1	11	..	0	0
Cr. Tartar, French, p. cwt.	84	0	..	85	0	86	0	..	88	0
Venetian grey ,,	0	0	..	0	0	0	0	..	0	0
brown ,,	65	0	..	75	0	60	0	..	70	0
Epsom Salts ....per cwt.	8	0	..	8	6	8	0	..	9	0
Glauber Salts .... ,,	5	6	..	6	0	5	6	..	6	0
Lime:										
Acetate, white, per cwt.	12	6	..	23	0	13	0	..	21	6
Magnesia:										
Carbonate...... ,,	42	6	..	0	0	42	6	..	0	0
Potash:										
Bichromate ....per lb.	0	5	..	0	5¼	0	5	..	0	0
Carbonate:										
Potashes, Canada, 1st sort ......per cwt.	31	0	..	0	0	32	6	..	33	0
Pearlashes, Canada, 1st sort ......per cwt.	32	0	..	0	0	33	6	..	0	0
Chlorate ....per lb.	0	11	..	0	0	1	1½	..	0	0
Prussiate ......per lb.	0	11¾	..	0	0	1	0	..	1	1
red .... ,,	1	9½	..	1	10	1	9½	..	1	10
Tartrate (*see* Argol and Cream of Tartar)										
Potassium:										
Chloride ......per cwt.	7	10	..	8	0	8	3	..	8	6
Iodide.......... per lb.	12	0	..	0	0	12	6	..	0	0
Quinine:										
Sulphate, British, in bottles ...... per oz.	5	9	..	0	0	4	9	..	0	0
Sulphate, French ,,	5	4	..	0	0	4	4	.	0	0
Sal Acetos ....per lb.	0	10	..	0	10½	0	10½	..	0	0
Sal Ammoniac, Brit. cwt.	38	0	..	40	0	33	6	..	35	0
Saltpetre:										
Bengal, 6 per cent. or under ......per cwt.	20	3	..	0	0	19	3	..	19	6
Bengal, over 6 per cent. per cwt.	19	6	..	20	0	18	9	..	19	0
Madras........ ,,	18	6	..	19	0	17	6	..	18	6
Bomb. & Kurrachee p.ct.	0	0	to	0	0	0	0	..	0	0
European...... ,,	0	0	..	0	0	0	6	..	0	0
British, refined ,,	25	0	..	25	6	22	0	..	23	6
Soda: Bicarbonate, p.cwt.	9	9	..	10	0	0	0	..	0	0
Carbonate:										
Soda Ash.....per deg.	0	1¾	..	0	0	0	2	..	0	0
Soda Crystals per ton.	77	6	..	0	0	87	6	..	90	0

	1869. s.	d.		s.	d.	1868. s.	d.		s.	d.
Soda:										
Hyposulphite..per cwt.	16	0	..	18	0	22	0	..	0	0
Nitrate........ ,,	16	9	..	17	0	11	0	..	12	6
Sugar of Lead, White, cwt.	39	0	..	40	0	37	6	..	38	0
Brown .... ,,	29	0	..	30	0	27	0	..	0	0
Sulphur (*see* Brimstone										
Verdigris .... per lb.	1	0	..	1	2	0	11	..	1	0
Vermilion, English..per lb.	2	6	..	3	0	2	6	..	3	0
China.... ,,	2	7	..	0	0		2	..	0	0
DRUGS.										
Aloes, Hepatic....per cwt.	80	0	..	180	0	100	0	..	180	0
Socotrine .. ,,	120	0	..	300	0	170	0	..	300	0
Cape, good.. ,,	29	0	..	32	0	29	0	..	30	0
Inferior ,,	18	0	..	28	0	18	0	..	28	0
Barbadoes ,,	80	0	..	200	0	70	0	..	205	0
Ambergris, grey ....per oz.	27	6	..	32	6	32	0	..	35	0
BALSAMS—										
Canada .... per lb.	1	3	..	0	0	1	6	..	0	0
Capivi .... ,,	1	9	..	1	10	1	8	..	1	9
Peru .... ,,	11	0	..	12	0	8	9	..	0	0
Tolu .... ,,	2	3	..	0	0	2	6	..	0	0
BARKS—										
Canella alba ....per cwt.	24	0	..	38	0	30	0	..	33	0
Cascarilla........ ,,	26	0	..	36	0	23	0	..	38	0
Peru, crown & grey per lb.	0	10	..	2	3	0	10	..	1	0
Calisaya, flat ,,	3	3	..	3	8	2	6	..	2	0
quill ,,	3	3	..	3	7	2	3	..	2	8
Carthagena ,,	0	8	..	1	6	0	9	..	1	3
Pitayo .... ,,	0	6	..	1	5	0	8	..	1	6
Red ...... ,,	3	0	..	8	0	1	6	..	6	0
Bucho Leaves ...... ,,	0	3¼	..	0	7	0	2½	..	0	9
Camphor, China.. per cwt.	97	6	..	100	0	130	0	..	132	6
Japan ,,	105	0	..	0	0	130	0	..	132	0
Refin Eng. per lb.	1	5	..	0	0	1	9	..	0	0
Cantharides ...... ,,	2	8	..	2	9	2	2	..	2	6
Chamomile Flowers p. cwt	50	0	..	90	0	45	0	..	80	3
Castoreum .... per lb.	4	0	..	32	0	5	0	..	32	0
Dragon's Blood, reed p. ct.	100	0	..	160	0	100	0	..	200	0
lump ,,	100	0	..	200	0	100	0	..	240	0
FRUITS AND SEEDS (*see also* Seeds *and* Spices)										
Anise, China Star pr cwt.	105	0	..	110	0	85	0	..	90	0
German, &c. ,,	26	0	..	38	0	36	0	..	40	0
Beans, Tonquin .. per lb.	1	0	..	1	6	1	2	..	1	6
Cardamoms, Malabar good ,,	7	9	..	8	0	7	9	..	8	6
inferior ,,	5	0	..	7	0	5	3	..	7	0
Madras ,,	4	6	..	7	9	4	9	..	8	3
Ceylon ,,	2	6	..	3	3	2	4	..	2	8
Corozo Nuts.... per cwt.	16	0	..	19	0	12	0	..	17	0
Cassia Fistula.. ,,	20	0	..	45	0	14	0	..	28	0
Castor Seeds .. ,,	11	0	..	13	0	11	0	..	12	0
Cocculus Indicus ,,	25	0	..	0	0	30	0	..	35	0
Colocynth, apple.. per lb.	0	5	..	0	9	0	7	..	1	1
Croton Seeds .. per cwt.	52	0	..	63	0	75	0	..	85	0
Cubebs .... ,,	36	0	..	40	0	40	0	..	45	0
Cummin........ ,,	55	0	..	65	0	21	0	..	28	0
Dividivi .... ,,	10	6	..	12	6	10	6	..	12	6
Fenugreek...... ,,	9	0	..	14	0	11	0	..	12	0
Guinea Grains .. ,,	36	0	..	37	0	43	0	..	44	0
Juniper Berries ,,	7	0	..	8	0	9	0	..	10	0
Myrobalans .... ,,	9	0	..	16	0	13	6	..	19	0
Nux Vomica.... ,,	11	0	..	14	6	14	0	..	17	0
Tamarinds, East India ,,	12	0	..	21	0	24	0	..	32	0
West India, new ,,	12	0	..	22	0	18	0	..	25	0
Vanilla, large .... per lb.	22	0	..	26	0	9	0	..	14	0
inferior ,,	10	0	..	21	0	3	0	..	8	0
Wormseed per cwt.	25	0	..	30	0	5	0	..	0	0
Ginger, Preserved, in bond (duty 1d. per lb.) per lb.	0	6	..	0	9	0	8	..	0	10
Gums (*see separate list*)										
Honey, Narbonne ,,	0	0	..	0	0	0	0	..	0	0
Cuba .... ,,	21	0	..	36	0	27	0	..	36	0
Jamaica.. ,,	25	0	..	45	0	25	0	..	46	0
Ipecacuanha .... ,,	5	8	..	0	0	7	6	..	0	0
Isinglass, Brazil.. ,,	2	6	..	4	5	2	3	..	3	11
Tongue sort ,,	3	1	..	5	1	3	2	..	4	5
East India ,,	2	3	..	4	4	2	0	..	4	0
West India ,,	4	0	..	4	4	3	6	..	3	11
Russ. long staple	5	0	..	8	0	5	6	..	7	0
,, leaf ,,	3	0	..	5	9	0	0	..	0	0
,, Simovia	1	6	..	2	6	1	6	..	2	6
Jalap, good ...... ,,	3	2	..	4	0	3	9	..	4	6
infer. & stems ,,	0	6	..	3	0	0	9	..	3	6
Lemon Juice ... per degree	0	1	..	0	1⅛	0	0¾	..	0	0⅞
Liquorice, Spanish per cwt.	63	0	..	68	0	65	0	..	70	0
Italian ,,	48	0	..	67	0	50	0	..	60	0
Manna, flaky .... ,,	4	0	..	4	1	3	0	..	3	6
small...... per lb.	2	0	..	2	6	1	6	..	1	9
Musk.............. per oz.	19	0	..	35	0	20	0	..	41	0
OILS (*see also separate List*)										
Almond, expressed per lb.	1	1	..	0	0	1	7	..	0	0
Castor, 1st pale .... ,,	0	5½	..	0	5¾	0	5¾	..	0	6
second .... ,,	0	4¾	..	0	5	0	5	..	0	5½
infer. & dark ,,	0	4¾	..	0	0	0	4¾	..	0	5
Bombay (in casks)	0	4½	..	0	0	0	4½	..	0	0
Cod Liver ......per gall.	5	6	..	7	0	4	6	..	7	0
Croton............per oz.	0	3	..	0	4	1	2	..	1	6
Essential Oils:										
Almond ....per lb.	42	6	..	0	0	38	0	..	0	0
Anise-seed ...... per lb	8	6	..	9	0	8	6	..	8	6
Bay ....per cwt.	65	0	..	70	0	75	0	..	0	0
Bergamot ......per lb.	8	0	..	12	0	12	0	..	20	0
Cajeput, (in bond) per oz.	0	1¾	..	0	2	0	1¾	..	0	2
Caraway ....per lb.	5	3	..	5	9	5	0	..	6	6
Cassia .... ,,	4	10	..	5	0	5	9	..	6	0
Cinnamon ......per oz.	1	0	..	4	6	1	0	..	3	6

	1869.				1868.			
Essential Oils, *continued:*—	s.	d.	s.	d.	s.	d.	s.	d.
Cinnamon-leaf ..per oz.	0	4	0	0	0	1½	0	2
Citronelle ...... ,,	0	2½	0	2¾	0	2¾	0	2⅞
fine.... ,,	0	3	0	3¼	0	3½	0	0
Clove............per lb.	2	7	0	0	2	6	0	0
Juniper .... ,,	1	9	2	0	1	9	2	0
Lavender........ ,,	3	0	4	3	2	9	3	9
Lemon.......... ,,	4	6	7	0	3	0	7	0
Lemongrass ....per oz.	0	4½	0	4¾	0	4½	0	5
Neroli .... ,,	0	5	0	6	0	0	0	0
Nutmeg .... ,,	0	4	0	8	0	3	0	8
Orange..........per lb.	5	0	8	0	5	0	7	0
Otto of Roses....per oz.	14	0	21	0	16	0	20	0
Peppermint:								
American ....per lb.	17	0	18	0	21	6	23	0
English ...... ,,	34	0	44	0	36	0	43	0
Rosemary ...... ,,	1	9	2	0	1	9	2	0
Sassafras........ ,,	4	0	4	6	3	0	4	0
Spearmint ...... ,,	4	0	18	0	12	0	24	0
Thyme.......... ,,	1	10	2	0	1	10	4	0
Mace, expressed .. per oz.	0	1	0	2½	0	0¾	0	2½
OPIUM, Turkey ...... per lb.	30	0	35	0	18	6	19	0
inferior ...... ,,	18	0	28	0	0	0	0	0
QUASSIA (bitter wood) per ton	175	0	0	0	125	0	0	0
RHUBARB, China, good and fine ....per lb.	4	6	9	3	6	3	10	0
Good, mid. to ord. ,,	0	8	4	0	1	6	5	9
Dutch trimmed ,,	10	0	0	0	10	0	12	0
Russian .... ,,	0	0	0	0	9	0	10	0
ROOTS—Calumba..per cwt.	40	0	50	0	26	0	40	0
China .... ,,	27	0	35	0	30	0	35	0
Galangal .... ,,	15	0	20	0	16	0	18	0
Gentian .... ,,	19	0	20	0	16	0	17	0
Hellebore ...... ,,	22	0	30	0	22	0	30	0
Orris............ ,,	38	0	44	0	36	0	42	0
Pellitory .... ,,	58	0	60	0	58	0	60	0
Pink..............per lb.	0	7	0	10	0	8	0	10
Rhatany.......... ,,	0	5	0	10	0	4	0	10
Sencka............ ,,	1	6	0	0	1	6	0	0
Snake .... ,,	1	2	0	0	1	9	0	0
SAFFRON, Spanish .. ,,	26	0	35	0	28	0	35	0
SALEP ....per cwt.	110	0	120	0	90	0	110	0
SARSAPARILLA, Lima per lb.	0	7	0	8	0	0	0	0
Para.............. ,,	1	0	1	3	1	0	1	3
Honduras .... ,,	1	1	1	8	0	10	1	4
Jamaica .... ,,	1	8	2	6	1	2	2	0
SASSAFRAS ....per cwt.	13	0	14	0	10	0	0	0
SCAMMONY, Virgin ..per lb.	28	0	34	0	28	0	35	0
second & ordinary ,,	10	0	23	0	10	0	23	0
SENNA, Bombay .... ,,	0	3	0	5½	0	3	0	5½
Tinnivelly .... ,,	0	2	0	11	0	2	0	10¼
Alexandria........ ,,	0	10	1	8	0	5½	0	11½
SPERMACETI, refined.. ,,	1	4	1	5	1	5	0	0
American .... ,,	1	4	0	0	1	4	1	5
SQUILL.............. ,,	0	1	0	2¼	0	1¼	0	2¼

GUMS.

	1869.				1868.			
AMMONIACI drop ..per cwt.	200	0	240	0	200	0	280	0
lump .. ,,	120	0	200	0	140	0	180	0
ANIMI, fine washed ,,	280	0	320	0	210	0	240	0
bold scraped ,,	200	0	280	0	190	0	215	0
sorts ...... ,,	100	0	190	0	105	0	185	0
dark ...... ,,	80	0	110	0	70	0	100	0
ARABIC, E. I., fine pale picked .. ,,	78	0	82	0	80	0	85	0
srts, gd. to fin ,,	68	0	78	0	55	0	75	0
garblings.. ,,	45	0	62	0	40	0	50	0
TURKEY, pick. gd to fin. ,,	170	0	220	0	170	0	210	0
second & inf. ,,	90	0	160	0	85	0	160	0
in sorts .. ,,	70	0	100	0	68	0	84	0
Gedda.... ,,	38	0	45	0	47	0	57	0
BARBARY, white .. ,,	83	0	85	0	70	0	80	0
brown .. ,,	67	6	72	6	70	0	80	0
AUSTRALIAN ...... ,,	25	0	45	0	36	0	50	0
ASSAFŒTIDA, com. to gd ,,	23	0	85	0	55	0	90	0
BENJAMIN, 1st qual. ,,	240	0	500	0	280	0	560	0
2nd ,, ,,	140	0	220	0	140	0	240	0
3rd ,, ,,	50	0	120	0	60	0	110	0
COPAL, Angola red ,,	100	0	107	6	60	0	70	0
Benguela .. ,,	100	0	110	0	70	0	87	0
Sierra Leone..per lb.	0	5	1	4	0	7½	1	4
Manilla ....per cwt.	32	0	50	0	26	6	45	0
DAMMAR, pale .... ,,	95	0	105	0	87	0	95	0
EUPHORBIUM ...... ,,	15	0	16	0	13	0	19	0
GALBANUM .... ,,	220	0	250	0	240	0	280	0
GAMBOGE, pckd. pipe ,,	240	0	300	0	240	0	320	0
GUAIACUM ....per lb.	0	8	1	4	0	6	2	0
KINO..............per cwt.	60	0	120	0	100	0	150	0
KOWRIE, rough.... ,,	47	0	60	0	33	0	40	0
scraped .. ,,	63	0	112	0	42	6	100	0
MASTIC, picked......per lb.	5	0	5	6	5	0	7	0
MYRRH, gd. & fine per cwt.	200	0	260	0	170	0	220	0
sorts......	90	0	170	0	80	0	140	0
OLIBANUM, p. sorts	80	0	85	0	85	0	86	0
amber & ylw.	70	0	78	0	66	0	82	0
garblings .... ,,	26	0	46	0	25	0	47	0
SENEGAL ....per cwt.	77	6	82	6	80	0	85	0
SANDARAC .... ,,	73	0	98	0	82	6	107	6
THUS.............. ,,	13	0	14	0	13	0	14	0
TRAGACANTH, leaf.. ,,	220	0	360	0	220	0	380	0
in sorts ,,	115	0	210	0	150	0	200	0

OILS.

	1869.				1868.			
SEAL, pale..........per tun	£39	0	40	0	36	0	0	0
yellow to tinged ,,	35	0	38	0	31	10	34	10
brown........ ,,	31	0	32	0	31	0	0	0
SPERM, body ...... ,,	90	0	0	0	90	0	0	0
headmatter ,,	0	0	0	0	0	0	0	0

	1869.				1868.			
Oils, *continued:*—	£	s.	£	s.	£	s.	£	s.
COD .... ,,	44	0	45	0	38	0	39	0
WHALE, South Sea, pale ,,	37	0	0	0	35	0	36	0
yellow ,,	36	0	0	0	34	0	0	0
brown ,,	34	0	35	0	33	0	0	0
East India, Fish ,,	32	0	0	0	31	0	0	0
OLIVE, Galipoli ...... ,,	55	0	0	0	68	0	0	0
Trieste ...... ,,	54	0	0	0	67	0	0	0
Levant ...... ,,	52	0	0	0	62	0	0	0
Mogador...... ,,	51	0	0	0	61	0	62	0
Spanish ...... ,,	53	10	54	0	63	0	65	0
Sicily .... ,,	53	0	0	0	65	0	0	0
COCOANUT, Cochin.. per ton	43	10	44	0	53	0	0	0
Ceylon .. ,,	41	0	42	0	51	0	0	0
Sydney ,,	38	0	42	0	44	0	50	0
GROUND NUT AND GINGELLY:								
Bombay	0	0	0	0	0	0	0	0
Madras..................	40	0	41	0	40	0	41	0
PALM, fine	41	10	42	0	40	0	10	0
LINSEED	31	0	31	5	30	15	0	0
RAPESEED, English, pale ..	41	0	0	0	34	0	0	0
brown........	39	0	0	0	31	10	32	0
Foreign pale....	42	0	42	10	35	10	0	0
brown........	31	10	0	0	32	0	0	0
COTTONSEED	30	0	36	0	29	10	36	10
LARD......................	70	0	72	0	65	0	67	0
TALLOW	35	0	0	0	37	0	0	0
TURPENTINE, American, cks.	26	9	0	0	27	0	28	0
PETROLEUM, Crude	14	0	0	0	11	10	0	0
	s.	d.	s.	d.	s.	d.	s.	d.
refined, per gall.	1	7	0	0	1	5	0	0
Spirit ,,	0	10	0	11	1	0	0	0

SEEDS.

	1869.				1868.			
	s.	d.	s.	d.	s.	d.	s.	d.
CANARY ....per qr.	55	0	65	0	0	0	0	0
CARAWAY, English per cwt.	40	0	48	0	0	0	0	0
German, &c.....	34	0	43	0	36	0	42	0
CORIANDER	20	0	21	0	18	0	20	0
HEMP ....per qr.	42	0	44	0	42	0	44	0
LINSEED, English per qr...	0	0	0	0	65	0	72	0
Black Sea & Azof	58	6	0	0	61	6	62	0
Calcutta ,,	61	6	62	0	64	0	0	0
Bombay ,,	62	0	62	6	63	6	0	0
St. Petrsbrg. ,,	56	0	57	0	59	6	60	6
Mustard, brown..per bshl.	14	0	17	0	15	0	17	0
white.. ,,	13	0	18	0	10	0	12	0
POPPY, East India per qr,	58	0	0	0	57	0	0	0

SPICES.

	1869.				1868.			
CASSIA LIGNEA ....per cwt.	124	0	132	0	122	0	129	0
Vera .... ,,	45	0	85	0	60	0	84	0
Buds .... ,,	140	0	162	6	140	0	155	0
CINNAMON, Ceylon,								
1st quality ....per lb.	2	0	3	7	2	4	3	1
2nd do. ...... ,,	1	9	3	5	1	9	2	10
3rd do. ...... ,,	1	4	3	2	1	8	2	5
Tellicherry ...... ,,	2	5	2	9	1	9	2	2
CLOVES, Penang.... ,,	0	10	0	11¼	0	10	0	11
Amboyna........ ,,	0	4½	0	5½	0	4¾	0	5¾
Zanzibar .... ,,	0	3	0	0	0	3⅓	0	4
GINGER, Jam, fine per cwt.	90	0	200	0	90	0	140	0
Ord. to good .. ,,	36	0	80	0	36	0	80	0
African.......... ,,	24	6	25	0	25	0	26	0
Bengal .... ,,	26	0	27	0	25	6	26	0
Malabar .... ,,	0	0	0	0	0	0	0	0
Cochin .... ,,	38	0	120	0	40	0	125	0
PEPPER, Blk, Malabar, per lb.	0	5	0	5½	0	4¼	0	5
White, Tellicherry ,,	0	5	0	6	0	5	0	6
Cayenne .... ,,	0	4	0	8½	0	6	0	8
MACE, 1st quality ..per lb.	2	10	3	6	2	9	3	6
2nd and inferior.. ,,	2	0	2	8	1	6	2	7
NUTMEGS, 78 to 60 to lb.	2	3	4	2	2	1	4	4
90 to 80 ,,	1	10	2	2	1	6	2	0
132 to 95 ,,	1	5	1	9	1	2	1	5

VARIOUS PRODUCTS.

	1869.				1868.			
COCHINEAL—								
Honduras, black ..per lb.	2	10	4	0	3	3	4	5
,, silver .. ,,	2	7	3	1	3	0	3	9
,, pasty .. ,,	0	0	0	0	1	10	2	10
Mexican, black .... ,,	3	0	3	2	3	2	3	4
,, silver .... ,,	2	8	2	11	2	11	3	3
Teneriffe, black....	3	0	4	0	3	2	4	3
,, silver.... .	2	8	5	0	3	2	3	7
PUMICE STONE ..per ton	120	0	160	0	120	0	160	0
SOAP, Castile ....per cwt.	35	0	0	0	38	0	39	0
SPONGE, Turk. fin pkd pr lb.	12	0	15	0	12	0	14	0
Fair to good .. ,,	5	0	11	0	5	0	0	0
Ordinary...... ,,	2	0	4	0	2	0	0	0
Bahama............ ,,	0	6	2	3	0	8	1	9
TERRA JAPONICA—								
Gambier .. per cwt.	16	0	17	3	17	3	17	9
Free cubes ,,	19	6	22	0	25	0	26	6
Cutch ...... ,,	25	6	26	6	30	0	32	0
WOOD, DYE, Bar ..per ton	£4	0	£4	15	£4	10	£5	0
Brazil .... ,,	0	0	0	0	70	0	85	0
Braziletto .... ,,	0	0	0	0	0	0	0	0
Cam .... ,,	26	0	32	0	30	0	36	0
Fustic, Cuba...... ,,	7	15	8	10	8	0	9	5
Jamaica .... ,,	4	12/6	6	0	6	15	7	10
Savanilla........ ,,	0	0	0	0	6	0	6	5
LOGWOOD, Campeachy ,,	10	0	10	10	9	0	10	0
Honduras ...... ,,	6	10	0	0	4	10	4	15
St. Domingo .... ,,	6	0	6	10	4	5	4	10
Jamaica .... ,,	7	0	7	10	4	5	4	10
LIMA, first pile.... ,,	14	10	15	0	18	0	19	0
RED SANDERS...... ,,	8	0	0	0	7	0	7	5
SAPAN, BIMAS, &c. ,,	8	0	11	0	10	0	13	0